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NINTH

BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

OF MARYLAND,

FOR THE

Two Years Ending December 31st, 1891.

ANNAPOLIS:
C. J. BAUGHMAN & CO., STATE PRINTERS,
1892.

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MARYLAND STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,

January, 1892.

To His Excellency the Governor,
and the General Assembly of Maryland:

I have the honor to present the Ninth Biennial Report of the transactions of the State Board of Health, in accordance with the provisions of the Acts of Assembly of 1874 and 1880, Chapters 200 and 438, respectively, which require that "the Secretary of said Board shall, at each regular session of the Legislature, submit a full report of his investigations, with such suggestions and recommendations as he may deem proper."

Respectfully,
C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

MEMBERS OF THE BOARD.

(in chronological order.)

C. W. Chancellor, M.D.	Baltimore, Md.
J. Crawford Neilson, C.E.	Harford County, Md.
J. M. H. Bateman, M.D.	Easton, Md.
Jackson Piper, M.D.	Towson, Md.
John Morris, M.D.	Baltimore, Md.
James F. McShane, M.D.	Baltimore, Md.
Hon. John P. Poe,	Attorney General.

OFFICERS OF THE BOARD.

Jackson Piper, M.D.	*President.*
C. W. Chancellor, M.D.,	*Sec'y and Executive Officer.*

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NINTH BIENNIAL REPORT

OF THE

State Board of Health of Maryland.

BY

C. W. CHANCELLOR, M. D., Secretary and Executive Officer.

1892.

PART I.

INTRODUCTORY.

Nulla Vestigia Retrosum has been the watchword of the State Board of Health for the two years ending December 31, 1891. The enemies which the Board has had to combat are disease and premature death, with the waste of energy which they involve, and with ignorance and indifference as their allies. The figures of the death rate in various localities, and as affected by altered circumstances, are the great test to which the sanitarian appeals, both as proof how much has been done by improved methods of hygiene, and how much still remains to be done where those methods have been either neglected or misapplied.

The conditions on which he insists as necessary are not easy to be met. He refuses to be put off with partial improvements, which are now very generally secured. A reduction in the death rate is not enough for him. The rate must be brought down not only to something less than the excessive amount at which it formerly stood, but to the much lower standard considered to be attainable under proper sanitary rules. The death rate in the healthiest of the metropolitan cities was, not long since, from twenty-four to thirty-two in a thousand; It has recently come down to sixteen or twenty in a thousand. But good sanitation can do more than this, and would have done more if its advocates had been listened to and obeyed. The further reduction should leave the death rate standing at not more than twelve in a thousand, and we cannot exclaim too loudly against the waste of life and health which is suffered needlessly to go on.

ADVANCES IN SANITATION.

What sanitary science can effect, where it has fair scope, is shown conclusively from the changes wrought in some of the large Poor District Schools of London. The work in these is carried on under conditions far from favorable, but with a very marked success, the more encouraging on this account. Many of the inmates of these schools are orphans of the lowest type, taken from the slums, some with developed diseases upon them, and all suffering from the consequences of early neglect. In a number of these separate or district schools there are now no deaths from measles, whooping-cough, typhoid, scarlet fever or diphtheria. The general death rate is about 10 in 1,000, and of those who are not in the probationary wards, of those who come in without developed disease upon them, the death rate is less than three in one thousand, or less than one-third of the death rates prevalent among the children of the general population of the same ages.

The process of reducing the death rate was an extremely simple one. The result has been due to the observance of rudimentary factors in sanitation. The premises were first drained and cleared of foul sewage smells, and when this had been done the death rate among the children fell immediately from twelve to eight. The next thing was that the children were regularly and thoroughly washed from head to foot, a course followed by a further reduction in the death rate to something less than a third of what it had originally been. Some further changes were made in the same direction. The rooms were better ventilated, and better bedding and separate beds were provided for the children. This gave another reduction to less than three in a thousand, at which the rate now stands. The children who had been dull and pallid under the old *regime* became bright and fresh-looking.

Not less striking has been the result of improved sanitation in the military service of England. A quarter of a century ago the death-rate in the "Guards" was twenty per thousand. It is now six and a-half per thousand. In the "Home Army" it was seventeen per thousand, and is now about eight. In the Old Indian Army it was sixty-nine per thousand, and it has been since brought down, first to twenty, and now to about fourteen. How much more may still be done is shown by the example of Germany, where the army death rate is about five in a thousand, and where the soldier, after his three years training, comes back to civil life with so improved an industrial aptitude that he is worth thirty per cent. more in the labor market than before.

A high death rate, it must be borne in mind, implies not only a waste of life, but a concurrent waste of time and energy, in consequence of the greater prevalence of non-mortal diseases which accompany it without fail. Nor is this all. Whether in sickness or in health, the whole bodily machine is working at a lower power. To diminish the death rate is not only to save lives, but to add health and vigor to the survivors. With increased vitality there is less temptation than before to some forms of excess injurious to health. The working man no longer needs the stimulus of drink as the most ready cure for the dullness or depression of existence at half power. He is a different man, and he feels himself to be a different man, in body and in mind alike. He can do more work and better work, with fewer intervals of enforced inaction. It is not only that he has prospect of a longer life, but that he enjoys a life more worth living while it lasts. This it is which gives the figures of a death rate their full significance in the view of the sanitary reformer, and which stamps as a crime against society the wilful neglect or breach of known sanitary laws.

The first General Board of Health of England distinctly warned local authorities and executive officers that they were responsible under the old common law for acts of "nonfeasance," of "misfeasance," and of "malfeasance"; and if an architect or a contractor supplied with a good plan, and with the latest improvements before him, were from *mala praxis* to construct an edifice with a large stagnant cess-pit beneath or near, productive of disease to the occupants, he would certainly be liable in damages for his malfeasance.

RESULTS OF GOOD AND BAD SANITATION.

What would be the grand result in Maryland towns if abundant supplies of pure water were provided, and fouled water or household sewage were constantly carried out of every house by self-cleansing house-drains, into self-cleansing sewers in the streets, and from these self-cleansing sewers on to sewage farms, is indicated in the results of European towns more or less completely sewered, in which there has been a reduction in death rates by fully one-half. There can be no reasonable doubt that like reductions might be effected on the same principle in Baltimore and other Maryland towns. It admits of clear proof, from what-has been done in other cities, that had sewage works. on comprehensive plans, been executed in Baltimore ten years ago, the city death rate would at this present time be reduced by at least five in the thousand, and would probably stand at an annual average of 12 in the 1,000. Instead of being in their present condition the harbor and river would have been purified, first instead of last, and the sub-soil of the city would be pure instead of being in a condition which has been described as a "disgrace to the city and to civilization."

It may not be amiss or unimportant at this time to display, in the way of warning, the wholly unimmagined and gigantic extent of the evil of sanitary "malfeasance," in the results on the State, the cost in lives, and of the money value in lives chargeable and inflicted on the State *mala praxis*, and by "malfeasance." As to the value of the lives, we may take the estimate of Dr. Farr in relation to the actual cost, and the average actual value of every human life in England at seven hundred dollars. The total loss of lives in Maryland for the Census year of 1880, was in round numbers 30,000, and of this number one fifth, or 6,000 were from preventable diseases. The total loss of lives from preventable diseases every day during the year was about 16.50, and the daily loss in money $11,550. Every week the average total loss of lives from preventable diseases was 115.50, and the total loss in money $80.850. We may estimate, therefore, that the average loss of lives every year from such diseases in the State is about 6,000, and in money $4,200,000 annually. Such will be found to be the rate of cost from delay of the practical application of the power of sani tay science, when properly administered.

The sanitary works of drainage and improved water are, however, sometimes countervailed by overcrowding. Let us look at the case of the workingman under that condition. Experience shows that there is an excessive death rate in single-roomed tenements, and a still lower death rate in three-roomed tenements. Increased living room space must be paid for, and is it not worth while for the mechanic who is getting his $15 or $18 a week to pay 50 cents or $1.00 a week more for such space as he may get in a model dwelling in which it is proved that on an average he obtains full ten years more of life and working ability?

In Europe important advances have been made in the improvement of ventilation. Stoves have been introduced which bring in constant supplies of fresh air, warm it, circulate it, and carry out the vitiated air. These stoves appear to be well adapted for large schools where the condition of the air is denoted by the large death-rate among the teachers.

SANITARY FACTORS.

Another recent invention for sanitation is an arrangement for personal washing. A French Colonel ascertained that he could wash his men with tepid water for a *centime*, or one-fifth of a cent, per head, soap included. The man undresses, steps into a shallow vessel of tepid water, soaps himself, when a jet of tepid water of considerable force plays upon him, and he dries and dresses himself in five minutes, against twenty minutes in the bath, and with five gallons of water against sixty or seventy in the usual bath. In Germany they have an arrangement under which half a million of soldiers are now regularly washed, with the result by this important sanitary factor of the reduction of their army death-rate beyond any in Europe. Sir Henry Doulton, of London, has invented an apparatus specially applicable to schools, in which a child may be completely washed in three minutes. The economy of cleanliness has been long known, a pig that is regularly washed takes on one-fifth more of flesh with the same amount of food than a pig that is unwashed. Having in view the holy doctrine of "wash and be clean," it would be a great sanitary advance if our public schools were provided with baths. Think of the comparative sanitary result of the washed children of a whole school as against the common one of the fouled-air and badly washed children. Look at the service to the poor mother who has no means of washing her children at home.

In sanitary sceince the true progress may be said to be in small things, and advances must be made in well examined details. Such, however, as are now attained, if applied, will effect a conservancy of life and force, and of productive power heretofore unknown; they will prevent slaughters greater than any inflicted in modern wars; greater than was sustained by the combined armies of the United and Confederate States during the terrible civil war.

The enlargement of the powers of the County Boards of Health, with some security for sanitary qualification and reasonable compensation to local health officers would offer new opportunities which would conduce to improve local organizations. If due exertions were made to inform the taxpayers of their paramount interests in sanitary work, they might be led to make a new and clear start, rejecting the sordid idea that pestilence is better than a depleted exchequer. But if the matter is to be argued out on the highest utilitarian grounds, the best and most convincing shape in which the case can be presented is that sickness weakens the productive force of the population and thereby augments the proportion of dependent pauperism.

PART II.

REVIEW OF THE OPERATIONS OF THE BOARD.

The following is a summary of the more important operations of the State Board of Health during the two years ending December 31, 1891.

The biennial period has been one of considerable activity in the sanitary affairs of the State, and one of the most successful in undertakings that has yet been chronicled. The epidemic at Cumberland, coupled with the numerous outbreaks of typhoid fever and diptheria in various sections of the State, have greatly augmented the labors of the Secretary, and at the same time demonstrated the necessity for larger appropriations in order to meet the increased demands that are being constantly made upon the board for aid in inproving the sanitary conditions in many localities of the State.

The growing interest manifested in the subject of hygiene by all thoughtful observers and all enlightened advocates of social improvement is the offspring of a deeply felt public necessity, and the principle, which is coming to be generally recognized, that the protection of the public health by the State is as truly a right of the people as the protection of persons and property against violence and fraud, is not a mere sentiment of philanthropy, but is sanctioned alike by just reasoning and sound political economy.

Everything which tends strongly to call attention to the conditions that influence public and individual health is calculated to do great good, and in this connection we may regard the comparatively mild outbreak of typhoid fever at Cumberland as an instance in which a benificent Providence vouchsafed good out of what was considered at the time a great misfortune. It is true that some good people perished from the disease, and others suffered in their affections and in their wordly circumstances; but it is questionable whether anything short of such an affliction could have combined all classes and interests so effectually and ardently in an effort to discover and remove the causes which had proved so disastrous to the health of the community. In the season of danger, not only did the importance of sanitary reforms become manifest to minds on which, possibly, nothing short of a moral pestilence could have made an impression; but the experience of two outbreaks of fever within a short time gave an impetus to exertions which it is hoped will be productive of good long after the causes from which they sprung shall have been forgotten. It matters not how little credit or thanks may be accorded the executive officer of the State Board of Health for his efforts in behalf of the public good, no one can be found to complain of remissness of duty on his part, in connection with this or any other sanitary investigation he has ever made. For a health officer to remain silent in the presence of threatened pestilence would be to act the part of a serpent divested of its rattle, with no warning from the noise, but much more danger from the *silence*.

QUARTERLY MEETINGS.

The Board meets quarterly and as much oftener as may be necessary; but the Secretary gives his whole time to the duties of his position, and is fully empowered by the Board to take all necessary steps to combat disease and arrest epidemics wherever and whenever they may appear, fully reporting his work at each quarterly meeting. In the exercise of the functions of his office he has during the past two years made an unusally large number of official visits to different localities in the State, where his services were required, and has prepared and distributed no fewer than 5,000 circulars and pamphlets, relating to sanitary measures, which timely warnings have undoubtedly served to guard against much sickness, while a firm and judicious enforcement of the sanitary laws of the State has done no little to promote exemption from disease. He has also prepared and submitted several special reports, which were approved by the Board, and will be found under an appropriate head in this report. He confers, from time to time, with local authorities and their officers, and gives advice and plans for the sanitary improvement of towns, villages and public buildings, when requested; he directs inquiries into the causes and spread of infectious diseases, and aids the local authorities in arresting the same; he receives and investigates complaints in regard to nuisances, the adulteration of food and drinks, and the sale of unsound and unwholesome food, and issues instructions for the correction of such evils. He collects and studies the vital statistics of the State, with the view, (1) to ascertain the cause, method of communication or propagation, and prevention of disease; and (2) to acquire the necessary knowledge on which to found intelligent and useful sanitary legislation; he corresponds with other State Boards of Health, and with local boards, health officers and physicians of this State, and thereby secures an interchange of useful sanitary information, especially respecting the cause, treatment and progress of epidemics; he conducts all the correspondence of the Board, and keeps on file all such correspondence and all reports from other boards; he prepares circulars, blank forms of returns, and such instructions as may be necessary, and distributes them to local boards, physicians and individuals throughout the State; he visits when requested, localities, towns and villages in the State to investigate the cause of any existing disease, and when directed by the Governor or any other State officials, makes special inspections of public buildings, asylums, prisons and other institutions; he prepares and submits Special and Biennial Reports of his investigations, with such suggestions and recommendations as may be deemed proper. The work done by the Secretary during the biennial period just ended will be found in the quarterly and special reports herewith transmitted.

LOCAL BOARDS OF HEALTH.

The State Board of Health was created in 1874, owing to the urgent necessity of considering what measures could be adopted to improve the general sanitary conditions of the towns, villages and rural districts of the State. At first the powers of the Board were limited to advisory functions; but subsequently these powers have been so augmented as to enable the Board to enforce necessary sanitary provisions for the protection of the public health. This central board was established as a body of permanent nature, and local or county boards were created by the Act of 1886, Chapter 22, consisting of the County Commissioners in each county, who were to constitute, ex-officio, a local board of health for the respective counties, with a health officer of their own appointment. These local boards were intended to assist the central or State Board, and thus it was expected that the sanitary administration of the State would be carried out more effectively by the efforts of both central and local boards of health, which would keep up constant communication between themselves.

In 1888, and again in 1890, the attention of the Legislature was called to the fact that the provisions of the law of 1886 were not carried out properly and efficiently by the County Commissioners, and that qualified health officers had been appointed only in a few of the counties; and that those appointed were so poorly paid they could not afford to give the necessary time and attention to the duties of the office. In several instances appointments have been made upon purely political grounds, the appointees having no special knowledge of hygiene or the general principles of sanitation, and being for the most part incompetent to perform the duties of the office properly, their efforts have proved of little avail. It may be said to their credit, however, that they did the best they possibly could.

Unless local boards are supplied with well-qualified sanitary officers, all efforts for the prevention of epidemic or infectious diseases will prove unsuccessful, and might, in some cases, entail expenses without adequate results. Such being the actual state of affairs, it is an immediate and pressing necessity in sanitary administration that the County Commissioners should organize as boards of health for their respective counties, and that the central or State Board of Health should be empowered to appoint a local health officer in each county, who has more or less general knowledge of hygiene and public health, and who shall be *ex-officio* the secretary and executive officer of the county board. Such a health officer would be able to assist the State Board of Health greatly in carrying out matters pertaining to sanitation in the counties without friction, and in such a manner that popular feeling would not be provoked by reason of interference with local self-government on the part of the central board.

A HEALTH CODE FOR TOWNS AND VILLAGES.

On July 2, 1890, certain rules and regulations were established by the State Board of Health for the sanitary government of towns and villages, under the Act of 1890, Chapter 622, entitled "An act for the better preservation of the public health," which clothes the

Board with authority to "make such rules and regulations respecting nuisances, sources of filth and causes of sickness as it shall judge necessary for the public health." This power may seem, at first view, to interfere with the enjoyment of private rights; but it belongs to that class of police regulations to which individual rights are subject, and is indispensable to the well-being of the body politic.

As a population becomes more dense the necessity for such power and its active and vigilant exercise becomes more and more apparent. Society exists not by sufferance, but by right, and has a right to protect itself against the wilful or negligent act or conduct of those who wantonly destroy the health, not only of their own families, but also that of their neighbors, by maintaining filthy pig-pens, slaughter-houses, stables, privies, cesspools, or what not upon their premises.

These rules and regulations, which are given below, after being revised and approved by the Attorney General of the State, were made public on the 1st day of August, 1890, and declared to be in full force and effect in every town and village of the State, subject to their provisions:

RULES AND REGULATIONS FOR THE SANITARY GOVERNMENT OF TOWNS AND VILLAGES IN MARYLAND.

INSPECTORS.

RULE 1. For the purposes of the Act of 1890, Chapter 622, the Health Officer of any town or village in this State, or, if there be no local Health Officer, the Health Officer of the County in which the town or village is located, shall have and exercise the authority of an Inspector of the State Board of Health, with power to superintend the enforcement of the Rules and Regulations of the said Board, within the limits of their respective sanitary jurisdictions, subject to the provisions of the Act.

RULE 2. Should no local or County Health Officer exist, or should such officer refuse or neglect to perform the duties contemplated in these Rules, then the town authority, if it be an incorporated town, or the district Justice of the Peace, if it be not an incorporated town, shall have and exercise the authority exercisable by local or County Health Officers under the foregoing rule.

PRIVIES, WATER-CLOSETS, &C.

RULE 3. On the written application of any person to a local or county Health Officer or Inspector of the State Board of Health, stating that any drain, water-closet, earth-closet, privy, privy-pit or cesspool, on or belonging to any premises within the area of his sanitary jurisdiction, is in a state of nuisance or injurious to health, said Officer or Inspector shall examine the premises, and if the drain, water-closet, earth-closet, privy, privy-pit or cesspool shall appear to be in bad condition or to require cleaning, alteration or improvement, the said Officer or Inspector shall give notice in writing to the owner or occupant of the premises, requiring him forthwith, or within a reasonable time therein specified, to do the necessary work; and if such notice is not complied with in due time, the person to whom it has been given shall be liable to prosecution, as provided in the Act.

HOUSES TO BE PURIFIED.

RULE 4. Where, on the certificate of any two legally qualified medical practitioners, or any three persons affected, it shall appear to any Health Officer or Inspector that any house or part thereof is in such a filthy or unwholesome condition that the health or comfort of any person is affected or endangered thereby; or that lime-washing, disinfecting, cleansing or purifying of any such house or part thereof would tend to prevent or check sickness, said officer or inspector shall give notice in writing to the owner or occupier of such house or part thereof, to lime-wash, disinfect, cleanse or purify the same, as he may think necessary. And if the person to whom such notice is given fails to comply within the time therein specified, he shall be liable to prosecution, as provided in the sanitary laws of the State.

REMOVAL OF OFFENSIVE MATTERS.

RULE 5. Where, in any town, village, or other place, it appears, to a Health Officer or Inspector that any accumulation of nightsoil, manure, filth or other noxious or offensive matter ought to be removed, he shall give notice to the person to whom the same belongs, or to the occupier of the premises whereon it exists, to remove the same; and if such notice is not complied with within twenty-four hours, or a reasonable time from the service thereof, the offending party shall be liable to prosecution as provided under this Act.

POLLUTED WELLS, &C.

RULE 6. When, on the representation of any physician or other person, it comes to the knowledge of a Health Officer or Inspector that the water in any well, spring, tank, cistern, or other water supply used or likely to be used by man for drinking or domestic purposes, or for manufacturing drinks for the use of man, is so polluted as to be injurious to health, the said Health Officer or Inspector shall give notice to persons using the water of the danger thereof, and shall forthwith cause a sample of the water to be sent to the State Board of Health for analysis, and should the water be found to be unwholesome or unfit for use, the said Board or its proper officer shall issue such instructions as may be deemed requisite to prevent injury to the public health.

HOW TO DEAL WITH PIG-PENS.

RULE 7. Whenever it is brought to the attention of a Health Officer or Inspector by any person, that any pig-pen is kept in such condition as to be a common nuisance; or that pigs are kept in front of any street, alley or highway, and not shut out from such street, alley or highway by a sufficient wall or fence, or that there exists, or is likely to exist, an accumulation of offal or slops, or any vegetable or animal filth in or near the pen; or that the pen is not constructed with floors impervious to water, or is not kept so as to be and remain at all times free from any offensive or noisome smell, the said Health Officer or Inspector shall, by written notice, served on the owner or keeper of the swine or pigs, require him within twenty-four hours, or a reasonable time specified therein, to remove the swine or pigs and thoroughly clean the pen and premises, so that there shall be no longer any offensive smell or injury to health therefrom. And any person or persons refusing or neglecting to conform to such notice, within the time specified therein, shall be immediately reported to the State Board of Health for prosecution under the Act.

SLAUGHTER-HOUSES.

RULE 8. Owners, agents or occupiers of slaughter-houses shall at all times keep the same in a cleanly and proper state, and remove any accumulated offal or filth from the premises at least once in every twenty-four hours during the months of May, June, July, August and September, and at least twice a week at all other times. The walls and floor of any room in which a dressed carcass or part of any animal is hung or kept, shall be maintained in a thoroughly cleanly condition at all times, and the walls and ceiling shall be lime-washed or otherwise disinfected at least once in every month.

Any Officer of Health or any Inspector appointed under these rules, may at any reasonable time enter and inspect such buildings or place whatsoever where animals are kept or slaughtered, and if the said building or place is found to be in a filthy or uncleanly condition the owner, agent or occupier shall at once be reported for prosecution.

UNSOUND MEAT &C.

RULE 9. Any local or County Health Officer, or any Inspector appointed under these Rules and Regulations, may at all reasonable times inspect and examine any animal carcass, meat, poultry, game, fish, fruit, vegetables, milk or other article of food exposed for sale, or of preparation for sale, and intended for the food of man; and if any such animal carcass, meat, poultry, game, fish, fruit, vegetables, milk, or other article of food, appears to such Health Officer or Inspector to be diseased or unsound or unwholesome, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person or persons to whom the same belongs, or did belong at the time of the exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to prosecution under the Act of 1890, Chapter 604, entitled "An Act to prevent Adulteration of Food and Drink."

ADULTERATED ARTICLES OF FOOD.

RULE 10. Any Health Officer, or any Inspector of the State Board of Health may procure any sample of food suspected to have been adulterated, and may submit the same to the State Board of Health for analysis. But the person purchasing any article with the intention of submitting the same to analysis shall, after the purchase has been completed, forthwith notify the seller of his intention to have the article analyzed by the State Board of Health, and shall offer to divide the article into three parts, to be then and there separated, and each part to be marked and sealed or fastened up in such a manner as its nature will permit; he shall deliver one part to the seller, and carefully retain another of said parts for future comparison, and submit the third to the State Board of Health for analysis. Such article may be forwarded through the postoffice or by express, carefully sealed with sealing wax impressed with a private seal or mark. If it shall appear from analysis that an offence against the provisions of the Adulteration Act of 1890, Chapter 604, has been committed, the State Board of Health shall take proceedings for the enforcement of the penalty imposed by the Act.

NUISANCES.

Rule 11. On receipt of any information respecting the existence of a nuisance the proper Health Officer or Inspector, within the limits of whose sanitary jurisdiction it exists, shall serve a notice on the person by whose act or default or sufferance the nuisance arises or continues, or if such person cannot be found, on the owner or occupier of the premises on which the nuisance arises, requiring him to abate the same within the time to be specified in the notice, and to execute such works and do such things as may be necessary for that purpose; and if a person on whom a notice to abate a nuisance has been served makes deficit in complying with any of the requirements thereof within the time specified, or if the nuisance, although abated since the service of the notice, is, in the opinion of the Health Officer or Inspector, likely to recur on the same premises, the said Health Officer or Inspector shall at once take proper steps to have the offender prosecuted in accordance with the provisions of the Act of 1890, Chapter 622.

HEALTH OFFICERS AND INSPECTORS TO REPORT TO THE STATE BOARD OF HEALTH.

Rule 12. The foregoing rules and regulations are hereby declared to be in force in the several towns and villages of this State, in accordance with the provisions of sections 4 and 6 of the above Act, and all Health

Officers or Inspectors, within the area of their respective jurisdictions, shall superintend and see to the execution thereof, and do all such acts, matters and things as may be necessary for enforcing the same, as the case may require. And the said Officers or Inspectors may from time to time, or whenever necessary, under the authority of the State Board of Health, direct any prosecution or legal proceedings for or in violation or neglect of any such regulation, and report promptly all such to the said Board of Health; *provided,* that no prosecution shall be instituted under these rules until a full report in writing of all the facts of the case has been submitted to the Executive Officer of the State Board of Health, and the proposed proceedings approved by him, on behalf of the said Board. All questions arising between Health Officers or Inspectors as to jurisdiction, or their relative duty in the abatement of any nuisance shall be referred to the Executive Officer of the State Board of Health for settlement.

PART III.

QUARTERLY AND SPECIAL REPORTS.

QUARTERLY REPORT OF C. W. CHANCELLOR, M. D., SECRETARY AND EXECUTIVE OFFICER OF THE STATE BOARD OF HEALTH OF MARYLAND, FOR THE QUARTER ENDING APRIL, 1890:

OFFICE STATE BOARD OF HEALTH,
BALTIMORE, April 23, 1890.

The first duty imposed by the law creating the State Board of Health requires that in taking cognizance of the interests of health and life among the people of the State, it shall make inquiries in respect to the causes of disease, especially of epidemics, and investigate the sources of mortality. The obligations of the Board to obtain, preserve and use such information, and by all suitable means to aid in promoting the public health have become generally well understood throughout the State, and it cannot be denied that, in this respect, it has evinced its worthiness of the trust which successive Legislatures have reposed in it. The sanitary condition of the State, and the work of the last quarter will be concisely presented under the following heads:

PREVALENT DISEASES.

Healthful as the past year has been, reports during the quarter just ended indicate an increase in the general amount of sickness, including the wide spread epidemic of "La Grippe," which prevailed quite extensively in this State during the months of January and February, 1890. Although the disease attacked nearly everybody, it was more inconvenient than dangerous. Its actual direct mortality was very small, the increase in the death rate having been conditioned upon complications and consecutive diseases; among these pneumonia may be charged with a very large percentage of the total deaths.

MEASLES. The increasing prevalence of this disease during the past few weeks, is receiving careful attention. The more we know of this disease the more conclusive is the evidence that whatever may be the importance of local conditions in promoting its propagation, the *contagium* or communicable poison which it produces and spreads abroad, should be controlled and "stamped out," as the very first sanitary duty by public health authorities. In order to accomplish this, separation of the well from the sick, and a careful supervision of schools and other places where children assemble together are measures of the first importance.

SCARLET FEVER AND DIPHTHERIA, the most conspicuous enemies of childhood, have not limited their prevalence to crowded cities, and the poorer classes in villages, but have prevailed to a limited extent in rural neighborhoods, and even in remote districts. These diseases are not altogether to be accredited to filth and foul air; they are contagious diseases, and spread by their own specific poisons. Hence, they will admit of a certain degree of definite sanitary control, chief among which may be reckoned isolation and disinfection. There is no plainer or more imperative sanitary duty imposed on physicians and householders than correctly to understand, and promptly to apply these well-known and efficient resources, by which alone such harmful diseases can be controlled and extinguished.

TYPHOID FEVER. This type of filth diseases has appeared in several localities during the last quarter; but it has not, in most instances, had a deadly prevalence. It has come to be one of the diseases with which the common sense of the people grapple successfully wherever they consult and implicitly follow competent sanitary officers and enlightened physicians. Foul pig-pens and stables, neglected privies and excremental filth, polluted water, and even the daily milk supplied to families (when defiled by water which has received any of the infectious matter of the disease) now command attention wherever a first case of the malady is discovered.

THE EPIDEMIC IN CUMBERLAND.

There has prevailed in Cumberland during the past three months a gastro-intestinal fever, very like typhoid, though some of the cases are said to lack the essential features of true enteric fever. Be this as it may, there is unquestionably a condition of ill-health prevailing in the city, which is worthy of serious notice, and which has, no doubt, been caused by impure water and insufficient drainage. I wish that the people could see more clearly the necessity of sanitary reforms, before sickness and death prove the dire penalty of neglect and apathy. Two years ago I uttered a warning voice against the highly polluted water supply of the city, and in a recent official visit I urged upon the authorities and the people, both in person and by printed circulars, the extreme necessity that existed at this time for the removal of all accumulation of debris and filth from about their habitation, which, under the influence of an increasing temperature, will become putrescent and dangerous. It is true that some steps have been taken to improve the water supply, which was conclusively shown two years ago to be dangerous; but an organized effort is sadly needed to secure the removal of accumulations of filth about dwellings, outhouses, alleys and streets, which have aided greatly in deteriorating the health of the people. The prevailing disease, whatever it may be called, is without doubt a filth disease, and absolute cleanliness of streets and premises is as essential to its abatement as an improved water supply. No one can gainsay the fact that the citizens of Cumberland are a highly intelligent, hospitable and refined people, but as to vigilance and progressiveness in sanitary matters, perhaps the less said the better.

THE NEW SANITARY LAWS, CHAPTERS 604 AND 622, 1890.

Hitherto the recommendations of the State Board of Health have not always been accepted or favorably acted on by the General Assembly, but the Board may be congratulated upon the confidence reposed in the wisdom and integrity of its purpose by the last Legislature. All the sanitary measures presented during the sessions of that body were promptly enacted into laws without amendment or opposition. A grand step was made in sanitary progress when the Legislature required, by statute, the compulsory notification of all deaths from contagious or infectious diseases to the health authorities, and made the failure to do so on the part of the medical attendant punishable by a fine of fifty dollars. Such a law is the outgrowth of the necessities of the age, for if the medical attendant be not compelled to make notification, how are the health officials to get the advice on which to take the necessary steps for the prevention of an epidemic? Hotel and boarding-house keepers, and superintendents or managers of public institutions are further required to report every case of contagious or infectious disease occurring within their respective establishments. It was also a wise measure to invest the State Board of Health with power to make rules and regulations for the abatement of nuisances in towns where there is no organized health department.

ADULTERATION OF FOOD AND DRINKS.

Chapter 604 of the last session of the Legislature has laid upon the State Board of Health the duty of conducting all investigations required by its provisions for preventing the adulteration of food and drinks. The law declares adulteration to be a misdemeanor, punishable by fine and imprisonment, and provides for a system of inspection, examination and analysis of articles used as food or drink, under such rules and regulations as the Board may see fit to prescribe, consistent with the provisions of the Act.

The first step to be taken in this important matter is an initiatory investigation to ascertain the nature and extent of the best methods for detecting adulteration under the law; also to secure the necessary data by which to fix the standards of purity. To facilitate this work, the draft of a Code of Rules and Regulations relating to the formation of a bureau of inspection and analysis is herewith presented for the Board's consideration, and also the draft of a circular to the public asking for information and suggestions that will lead to the detection and correction of the mischievous practices which the law is designed to prevent.

THE MEDICAL PRACTICE ACT.

As directed by the Board, I prepared and submitted the draft of an amendment to the Medical Practice Act of 1888, which provided for an appropriation sufficient to enable the Board to execute the provisions of the Act; but after conferring with the Executive Committee, it was decided to withdraw the proposed amendment, as the Committee of the Medical and Chirurgical Faculty, in connection with the Homeopathic Association, had presented a bill materially modifying the Act of 1888, which has proved inoperative because the proper material was not provided by the Legislature for its execution.

While the State Board of Health was alone instrumental in securing the passage of the Act of 1888, it had no desire to be burthened with additional duties and responsibilities, and was not, therefore, inimical to any change in the law that would relieve them of these duties. The Board, individually and collectively, has been, at all times, in full sympathy with the essential objects of the measure, and if its co-operation had been invited it would have aided cheerfully in securing an independent commission.

The great desire of the State Board of Health is to advance the public health interests of the State, and in this effort they hope to have the earnest support of all right-thinking physicians. Free themselves from petty jealousies, they must deprecate them in others, and endeavor to unite all influences in promoting the general welfare of the people. If, therefore, the Governor should see fit to withhold his approval of the bill now before him, as seems most probable, it may not then be amiss for this Board to consider what steps, if any, can be taken to render effective the Act of 1888, in order that it may not be "a dead letter on the statute books." A fairly liberal contribution by the members of the medical profession of both schools, who are most interested in weeding out "quacks" and "incompetents," would solve the problem, by enabling the State Board of Health to set the machinery of the law in motion.

Respectfully submitted,

C. W. CHANCELLOR, M. D.,

Secretary and Executive Officer.

Quarterly Report of C. W. Chancellor, M. D., Secretary and Executive Officer of the State Board of Health of Maryland.

The following is a summary of the more important operations of the Secretary's office for the quarter ending June 30th, 1890:

GENERAL HEALTH OF THE STATE.

Throughout the entire State there has been during the quarter just ended an unusual degree of good health. In some communities measles have been quite prevalent, but so far as our records, collected under Act of Assembly, chapter 622, approved April 8th, 1890, show, the mortality from this disease has been exceptionally small. Diphtheria, typhoid fever, scarlet fever, diarrhœal and dysenteric disorders, have been less prevalent than during previous years. The Cumberland epidemic, which at one time threatened to assume considerable proportions, has measurably abated. Upon these facts the people of the State are to be congratulated. With proper attention to the rules of healthful living, and the ordinary laws of sanitation there is no reason why Maryland, from the Atlantic to the Alleghanies, should not maintain the high standing to which her soil, climate and situation entitle her, as one of the most healthful and delightful States in the Union.

In the City of Baltimore, with its exceptionally low death rate, there has been the usual increased mortality at this season, among children under five years of age, owing, in a great measure, to improper food, or, more properly speaking, to adulterated and impure milk. But the fact must not be lost sight of that an *impure atmosphere* is an important factor in determining the prevalence of infant mortality. Undoubtedly, the method at present in use for the disposal of excretal filth in Baltimore City is fraught with danger to the future health of the community, and in the event of the introduction of infectious diseases may imperil not only the lives of our own people, but also the health of the surrounding country.

WORK OF THE SECRETARY'S OFFICE.

As the interest in measures for the restriction and prevention of disease increases throughout the State, the inquiries received at this office relative to various public health subjects, become more and more frequent. Many of these are of such a nature that they cannot be answered by any of the general circulars or documents issued by the Board, and a large amount of correspondence is necessary in replying to them. For a full account of the practical work done by this office, reference is made to the special reports and correspondence herewith transmitted.

DISTRIBUTING INFORMATION.

During the last quarter several thousand circulars have been distributed, setting forth preventive measures against the diseases incident to the summer months, and giving practical instructions in the useful knowledge of hygiene and the principles of disinfection. Circulars and blank forms have also been sent to all the physicians in the State, outside the limits of Baltimore City, which will aid them in making correct and prompt mortality returns of contagious and infectious diseases, in compliance with the provisions of the 1st and 2nd Sections of Chapter 622, Laws of 1890, which require that all medical practitioners in the State shall immediately give notice to the State Board of Health of every death occurring in his practice from any contagious, infectious or epidemic disease. Statistical returns, showing the mortuary history of the State, so far as these diseases are concerned, will be in this way collected for the first time, and will serve to show the exceptionally healthy condition of the State in this respect. The law only requires a report of *deaths;* but it is very desirable that all *cases* of infectious and contagious diseases be also promptly reported, for if the State Board of Health is to take any effectual measures to prevent the spread of infection or contagion, it is of the first importance that it should know, and know promptly, the exact locality of each case as it arises. The whole question is on an exact par with the means taken to prevent and arrest fires. What the first few moments are in the case of a fire, so the first cases of such diseases as small-pox, typhoid fever, cholera, diphtheria, scarlet fever, etc., are in relation to epidemics, in the ease with which they may be stayed or arrested in their spread, compared with the difficulties experienced when once they have made considerable headway.

A HYGIENIC LABORATORY NEEDED.

We have now arrived at that period in our progress when we might very properly consider the advisability of establishing a hygienic laboratory, offering facilities for investigating the causes of disease in our State and for imparting instruction to those desirous of devoting themselves especially to public health work. In order to execute sanitary matters efficiently and to extend the sphere of usefulness of the State Board of Health, it is necessary to have special sanitary officers in every county, possessing a general knowledge of sanitary and hygienic science. Without such officers to aid the State Board in carrying out sanitary administration, confusion and failure may be expected during the critical periods of epidemics. It is, moreover, essential that such a laboratory should be established in connection with the inspection of foods and drinks, where local health officers could obtain any information they may require by experimental and practical investigations. Thus a means of intercommunication would be opened up between the State Board of Health as a central bureau and the local health officers of each town and county, which would facilitate and render more accurate the returns relating to health matters, and it would also serve to train those engaged in these affairs in the discharge of their duties. To this laboratory the local authorities could send samples of suspected drinking water, food and beverages for analysis. The mineral waters of the State, some of which are thought to be valuable, could also be specially investigated with reference to their respective chemical elements, as well as their therapeutic and physiological action. By this means a chart showing the situation of the mineral springs and a complete descriptive work on the history and remedial value of the waters of Maryland could be obtained and circulated to the great advantage of the State.

THE MANUFACTURE AND SALE OF PATENT MEDICINES.

The compounding of patent medicines has increased year by year, and has become one of the most lucrative trades, and one found to be liable to numerous abuses. While the evil cannot be altogether stopped, it would be well if some steps could be taken to secure the passage of a law for the licensing of such medicine, in order to control the sale of the same, as in the case of spirits, for such medicines are in no way necessaries of daily life to the people; as vended among us there is certainly need for sanitary restrictions. I would suggest, therefore, that the Board take steps at once to secure the co-operation of the medical profession of the State in preparing for presentation to the next General Assembly the draft of a law providing for statistical returns to be made semi-annually respecting the number and kind of patent medicines sold in this State, and for imposing a "high license" upon all manufacturers, dealers and traveling peddlers selling such medicines.

FAILURE OF THE MEDICAL PRACTICE ACT.

The State Board of Health was the first organized body that made an effort to rid this State of "quacks" and "incompetents," styling themselves physicians. In 1888 this Board secured the passage of an Act making the diploma of a reputable college, verified by the said Board, a pre-requisite to practice medicine in Maryland. On account of certain defects or omissions made by the Legislature the Act, in the opinion of the Attorney General, required revision or amendment in order to render it effective, which amendments would have been presented for the consideration of the last Legislature, but for the fact that an organized effort was made by certain members of the medical profession, claiming to represent the Faculty of the State, to repeal the existing law and substitute for it a counter measure more radical in its provisions. Under the circumstances, the State Board of Health did not deem it expedient to oppose the proposed change in the law, which was represented to be in accordance with the wishes of the profession generally, and the Board, therefore, abandoned the effort to secure an amendment to the existing Act, and also any further participation in the matter.

It must be a source of great regret to every honest person that some measure cannot be adopted to stop the depredations on human life by quacks and imposters. The wise Romans banished all empirical pretenders in the art of medicine from the State; and, as far back as the sixteenth century the English Government enacted a law which provided, "That whoever, not qualified or authorized for practice, shall undertake a case, and the patient shall die under his hands, the person so presuming shall be arraigned at the bar as a felon."

ADULTERATION OF FOOD, ETC.

Under the provisions of the Act of Assembly, Chapter 604, approved April 8th, 1890, a Department of Food and Drink Inspection has been organized, and the work of condemning adulterated and unsound articles of food and drink is being actively prosecuted, as will appear from the reports of the Inspectors and Analysts herewith appended. The investigations by Prof. Tonry, the Board's Analyst, into the adulterations of milk, coffee, tea, whiskies, wines, etc., has been so far advanced as to furnish satisfactory proof that such adulterations are undoubtedly practiced, and to make it important to extend inquiries in this direction. The investigation will accordingly be carried on as long as the appropriation made by the Legislature lasts, certainly during the remainder of the present year and part of the next year. There is no apology for the man who wilfully adulterates human food and beverages; he is worse than the highwayman who demands your money *or* your life, whereas the adulterator takes both money and life.

IMPURE AND UNWHOLESOME MILK.

As milk is the only article of food which is supplied by nature for the nourishment of the young, it is important that it be furnished in as pure a condition as possible. No admixture with water, starch, coloring matter, or any other fluid or solid can be permitted without changing its merited position as the true type of an alimentary substance. Such interference with the proper composition of milk, be it ever so simple, has destroyed many an infant, or is attended with most severe results to them; and yet, there is no article of food so subject to adulteration.

Investigations made during the last month by the Board's Analyst, has established the fact that while a large proportion of the milk shipped from country farms or dairies outside the city is practically pure, and fully up to the required standard in solids and specific gravity, a large per centum of that sold by city dealers is adulterated, or so treated as to increase its bulk and proportionately lessen its nutritive qualities. This is made obvious by its appearance, its specific gravity, the quantity of cream which rises, or rather which does *not* rise to its surface, and by its chemical qualities. The injurious effects of such adulteration may be readily imagined when we consider the extent to which milk is used for nursing infants, as well as an article of food for both old and young. Adulteration by water or skimming the milk so reduces the nutriment as to produce a great increase in the mortality of children. On the other hand many of the brands of condensed milk on the market are even worse for children than the milk of commerce. Prof.

Cornwall, who analyzed sixteen samples of condensed milk for the New Jersey State Dairy Commission, found they contained from 38 to 42 per cent. cane sugar, glucose or molasses. The large amount of sugar necessary to preserve them renders them an unwholesome food for infants, and none too good for adults. Loeflund's Condensed and Sterilized Cream Milk seems to be the only condensed milk free from the above objections. In Germany it is largely fed to infants deprived of the breast, in preference to any other food.

In New York City the reduction in the percentage of adulteration, caused by the inspection of milk had the happy effect of reducing the death rate of children under five years of age to the extent of 3,673 children in one year. In Boston, there was a marked reduction in the mortality from cholera infantum, immediately following the inspection of milk, which began in 1883. Since beginning the inspection in this State, about six weeks ago, several dairies in Baltimore, which were found to be selling impure milk, have closed up their establishments to avoid prosecution, and a general improvement in the quality of the milk sold has already been observed.

FILTHY STABLES AND IMPROPER DIET FOR COWS.

A change is needed in a great number of cow stables throughout the State, not only as to food, but in the matter of ventilation, of lighting, of air space, cleanliness, water supply, and drainage. Milk produced from animals kept in overcrowded, filthy stables and fed on impure diet, as brewers grains and polluted water, is utterly unfit for small children dependent upon it for sustenance, even if it were innocuous to persons in adult life. Apart from the addition of adulterating substances, the milk from animals suffering with disease is liable to be sold, thus transmitting the same affliction to man. In regard to this matter, I have had a conference with the State Veterinarian, and hope to be able to devise a method to prevent the sale of milk from such animals.

POISONOUS CHEESE.

Since the occurrence of several hundred cases of cheese poisoning in the State of Michigan a few years ago, considerable attention has been given to this particular source of ill health. The symptoms in such cases are those of gastro-intestinal poisoning, such as is produced by bad sausage or spoilt fish, viz., nausea, vomiting, diarrhœa, nervous prostration, headache, etc. As a preventive against cheese poisoning it is recommended that every grocer, on cutting into a new cheese, should apply blue litmus paper to the cheese if it is moist, or, if it is dry, moisten it and then apply the litmus paper. If the paper is instantly colored red the coloring shows the presence of the poisonous acid, and the eating of the cheese will be attended with danger.

ADULTERATION OF WINES AND SPIRITS.

The wines and spirits, which have been inspected under the authority of the Food and Drinks Act, are principally such as are sold for medicinal purposes, and the examination, therefore, has been made with reference to their use as drugs as well as beverages, hence the United States Pharmacopœia of 1880 has been followed as the standard of requirement. All the samples of whiskey thus far examined have been found to be adulterated, while not a few of the American wines do not conform to the required standard. The terms "whisky" and "brandy" seem to be no longer applicable to spirits distilled from grain and mellowed only by time, or produced by the fermentation of grapes, but to adulterated compounds that have been submitted to the process of mixers, blenders and other so-called "improvers," until they are lamentably deficient in the requirements of every standard of purity.

Indeed it would seem to be quite impossible, at present, to get a pure article of either whisky or brandy. The mere fact of "coming out of bond," or "straight through the Custom House," is generally accepted as sufficient evidence that they are pure and genuine; but this is a delusion, as they are often flavored, colored and branded or labeled to meet the tastes of American connoisseurs. When such "stuff" is recommended for the sick, the aged and debilitated, or as a beverage for invalids convalescing from disease, a more insidious fraud can scarcely be imagined.

SOPHISTICATED BEER.

An Act to prevent and punish the adulteration of food and drinks, passed by the last Legislature, in addition to the penalties imposed, authorizes the Board to "publicly expose any adulteration or corruption of articles offered for sale as food or drink, etc." Under this provision, beer, ale and compounded spirits will be treated when found to be adulterated or corrupted. Lager beer, well made of malt or hops, is a pure and good beverage, possessing slightly exhilarating qualities, and might well take the place of whisky with those who indulge in the use of ardent spirits, and who might be won from a growing taste for strong drink; but adulterated, as it often is, with drugs, to save hops, it produces headache, nervous prostration, and is otherwise injurious to the system. The use of coculus indicus, tobacco, Indian hemp, or what not, is to be especially deprecated, for such substances impart intoxicating rather than stimulating qualities to malt liquors, and produce the lowest kind of inebriety, closely allied to insanity. The opinion has been expressed that many cases of brutal and purposeless violence, which are often recorded of those who drink beer to excess, are referable to the maddening influence of such ingredients. Much time and attention will, therefore, be devoted to this particular line of adulteration, in order to ferret out the "crookedness" of dishonest and unscrupulous manufacturers, if any such are to be found in this State.

UNSOUND FISH AND FRUITS.

My attention having been called to the fact that large quantities of fish that had been inspected and condemned in the Eastern markets were shipped and sold in this market, a competent Inspector, Mr. Jno. Streckfus, was appointed with authority "to inspect diseased, corrupted or unwholesome provisions offered or exposed for sale in this market or adjacent thereto, and issue notices to prevent the sale of such articles of food."

Under these instructions the Inspector has condemned and destroyed a large quantity of spoiled fish, fruits, vegetables, etc., amounting in the aggregate to twelve or fifteen tons. In this particular line the City Health Department and the large dealers in fish have offered valuable assistance.

A Meat and Market Inspector, G. Robert Godman, has also been appointed, with like powers to condemn diseased, unsound or corrupted meats, fowls, vegetables, etc,, and to keep watch over the manufacture of sausages, lard, etc., especially with reference to preventing the use of impure substances in the preparation of such widely used articles of food.

Respectfully submitted,
C. W. CHANCELLOR, M. D.,
Secretary.

Special Report on the Dangers Incident to the Water Supply of Lake Roland. By C. W. Chancellor, M. D., Secretary and Executive Officer of the State Board of Health of Maryland.

In a recent investigation into the sanitary conditions of several towns and villages in the State, my attention has been particularly directed to the fact that a large proportion of the drainage from the privies, pig-pens and stables of Lutherville, Baltimore County, finds its way into the headwaters of Roland run, and thence directly into Lake Roland, one of the sources of water-supply to Baltimore City. This circumstance is fraught with so much danger to localities in the city supplied with water from this particular source, that I have deemed it of sufficient importance to call together the Executive Committee of the Board, and submit for their consideration the following

SPECIAL REPORT:

Beautifully situated on the Northern Central Railway, about two miles above Lake Roland, and ten miles north from Baltimore, Lutherville would seem to offer, by its select position, peculiar advantages as a summer resort. Exposed by its elevated position to invigorating breezes, from whatever direction the wind may blow, this lovely spot appears to be particularly favored by nature to be a fit resting place for tired brain workers, and all persons in search of health and healthful surroundings.

The village has a resident population of about five hundred, which is nearly doubled during the summer months. There are quite a number of attractive residences, several large boarding houses or summer hotels, some of which are situated on the heights, from which magnificent views may be obtained of the surrounding country, and a rapidly increasing number of isolated summer cottages scattered here and there on the undulating grounds.

There is no system of sewerage nor is there a public water supply. Each individual cottage, boarding house and residence has its own supply of water, derived from wells and springs. All are subject to the same sanitary conditions and surroundings. Each building takes care, in a more or less imperfect manner, of its liquid and semi-liquid household refuse. As a rule, each cottage and boarding house has its own water-tight or leaching cesspool, but to avoid the annoyance of frequent emptying or pumping out, I am informed that these cesspools are for the most part, provided with overflows allowing the surplus liquid waters to soak away into the ground or run in pipes or open gutters into Roland run, which skirts the town at its lower level to the north and west, while the solids are retained in the cesspool an indefinite time.

The villagers more often drain their waste waters upon the surface of the ground near their houses, and use for the solid excretal matters the old-fashioned privies, some of which were found to be in an extremely unsanitary and disgusting condition. Of the two methods, however, the last, though unsightly, is, when properly cared for, the safest. The cesspool or cesspit method is attended with peculiar hazard, not only to the wells and springs of the town, but also to the waters of Lake Roland, which through Roland run, eventually receives a large proportion of the drainage from these places, as well as the offal and liquid filth thrown upon the surface of the ground in the immediate vicinity of the stream. Other sources of contamination are numerous pig-pens, cow-barns and stables, which, for the most part, drain directly into the stream.

It should be well understood that putrefying filth, of whatever character, in the immediate neighborhood of human habitations is a standing menace to the public health ; and while this applies even to the smallest habitations or isolated cottages, it is particularly applicable to large boarding-houses and summer hotels, where a considerable number of people congregate annually for pleasure or health, With few exceptions, this law has been violated at Lutherville, and the fact that the place has, up to this time, enjoyed comparative immunity from infectious disease must be explained, to a large extent, by its exceptional natural advantages.

Privy vaults as well as leaching cesspools are abominations which should be no longer tolerated in any civilized community, especially when they serve to poison drinking water derived from wells or springs, or to pollute the tributaries of any water-supply used for drinking or dietetic purposes. It is a fundamental principle, that all filth incident to human life should be removed thoroughly and immediately, or at least before putrefactive decomposition begins. With privy vaults, cesspits, pig-pens, etc., abounding, the general health will necessarily be affected.

It is from excretal sewage that we have most to fear, for it is in such matters that disease inducing germs, are most frequently found. At this time when we know that there is at least one centre of infection in Lutherville, all wells and springs and water-supplies that are in danger of being affected should be diligently watched and kept free from all possible surface defilement and underground pollution.

It is a well-ascertained fact that sewage, if not infected with germs of disease at one time, may become infected at another time, and therefore the drainage from the population of Lutherville is an ever-present danger to the health and lives of all who are furnished with water from Lake Roland, and especially at a time when typhoid fever exists in the village. It is true that running water may have its ordinary sewage matter destroyed in a measure by a retroversion of its elements to organic forms; but there is overwhelming evidence to show that this purifying influence cannot be relied upon to protect from specific germs of infection. The epidemics recorded by Murchison, page 449 et seq., at Festiniog in 1863 and in Dundee in 1864; by Prof. Frankland at Lausen, Switzerland, in 1880, and finally the Plymouth, Penn., epidemic in the spring of 1865, where twelve hundred persons were stricken down and more than one hundred out of a population of seven thousand died in a few weeks from typhoid fever occasioned by the dejections of a single patient suffering with the disease being washed into the stream miles above the town which it supplied with water, point to sewage matter in drinking water as an element of great danger. Recent experimen , moreover, show that dilution does not dissolve and dissipate the matter into innocuity, as the typhus miasm is dissipated by ventilation. *It is there*, and although one tumblerful may not contain it another will.

As we cannot distinguish between infected and non-infected sewage, the only perfectly safe course is to prevent as far as possible any sewage matter entering the source or tributary of a water-supply. In a report made to the Local Government Board cf England in 1874, Prof. Frankland says :

"Rivers or flowing water which contains any proportion, however small, of sewage or animal contamination should be considered as *suspicious or doubtful*, and any such water which is known from actual inspection to receive sewage either discharged into it directly, or mingling with its surface drainage must be regarded as dangerous drinking water."

Mr. Simon, the distinguished English Sanitarian, who rightly insists upon a high standard of purity for drinking water, in his second annual report to the City of London, observes that : "We cannot expect to find the effect of impure water always sudden and violent. The results of the continued imbibition of polluted waters are indeed often gradual, and may elude ordinary observation, yet be not the less real and appreciable by close inquiry. In fact, it is only when striking and violent effects are produced, that public attention is arrested ; the minor and more insidious, but not less certain evils are borne with the indifference and apathy of custom."

Many persons are still to be found who believe that if water is bright and clear, and not unpleasant to the taste, it must be good; whilst it has been proved, over and over again, that such water may be polluted with unspeakable filth, and that an excess of brilliancy and lightness is sometimes a suspicious sign.

Evidently wisdom lies in striving to remove all sources of contamination from water supplies; therefore, in closing this report I submit the following suggestions:

1. That the State Board of Health should as far as practicable, cause the abatement or discontinuance of every nuisance existing at Lutherville, whereby the water of Lake Roland is likely to be fouled. This may be done by enforcing the Act of 1886, Chapter 6, entitled "An act to prevent the pollution of streams etc."

2. That all privies, pig-pens, cow barns, slaughter houses and stables near any stream, or the tributary of any stream emptying into Lake Roland should be removed, or so constructed and kept as not to create any nuisance or drain into the stream.

3. That all decomposing animal and vegetable matters, such as manure heaps, should be protected from the rain by a simple roof or covering, thereby preventing soakage, which will drain into the stream.

4. That when old fashioned privies are used they should be kept dry and odorless by the use of dry earth and lime, and all deposits should be frequently removed.

5. That no filth, waste water or slops should be emptied near to or allowed to drain into the stream, and if emptied or discharged on the ground remote from the stream, the point of discharge should be frequently changed, in order to prevent saturation of the soil.

6. That all cesspools without cemented sides and bottoms, and all pig-pens, cow barns, stables and slaughter houses without floors impermeable to water, and all cesspits or mere holes in the ground for the reception of excretal matter, should be abandoned, and

under no circumstances should the drainage from such places be allowed to flow over the surface or saturate the soil near any well, spring, stream or other source of water supply, or any pond of water from which ice is gathered for household or dietetic purposes.

7. If cesspits, cesspools, or vaults are used for excremental matters,—a bad practice—the contents should never be allowed to accumulate and overflow, but such places should be frequently emptied and disinfected, and the contents carried far away from any source of water-supply, excremental matters deposited on the surface, or in boxes or pails should be constantly covered with dry earth or ashes, and removed at least once a week to a point remote from any source of water supply, and always deposited in a fresh spot.

8. It should be remembered that the beneficial cleansing power of earth does not continue for an indefinite period. Soil is liable to be overdosed with filth, and is then unable to carry on this purifying action, so that animal and vegetable matters in a state of decomposition will pass through it unchanged. Its particles require rest and free exposure to the air, before it recovers its exhausted powers.

The report was read and its several points were discussed, after which the following resolutions were unanimously adopted:

Resolved:—That in the opinion of the Executive Committee of the State Board of Health, the Special Report of the Secretary of the Board clearly establishes the fact that the waters of Lake Roland are liable to dangerous pollution from the drainage of Lutherville.

Resolved:—That the Committee concur in and endorse the recommendations set forth in the Report of the Secretary, and that the said Secretary be requested to lay the matter, with full explanations, before the Attorney General of the State as soon as possible with the view of ascertaining what action the Board would be justified in taking to protect the water-supply of Baltimore City, under the act of 1886, Chapter 6, or any other sanitary law of the State; and that such action as may be advised by the Attorney General. be executed by the Secretary as soon as possible.

REPORT ON THE CASES OF TYPHOID FEVER AT LUTHERVILLE, BALTIMORE COUNTY, MD., BY W. P. TONRY, INSPECTOR.

BALTIMORE, MD., August 24, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health.

DEAR SIR—As requested by you, I visited Lutherville, yesterday and report the following data. Referring to the accompanying map on tracing linen, the locations are marked by numbers.

Two cases of Typhoid occurred at location marked 1, M. B. Corkran, white, male, age 29, married, and residing at the location with wife, two children three and six years old, an older lady, and one servant girl, white, age 18 years, was sick with typhoid in June for 26 days, and recovered. Mr. Corkran before being taken sick, had been riding through the country, and had drank freely of the water in the different localities where his business called him. The clothing from the patient was not disinfected before being washed, and the wash water was thrown into a depression near the wash house, and was allowed to find its way into the ground wheresoever it would. By referring to the accompanying diagram of the house and grounds, it will be seen that it is probable some of the wash water may have found its way into the well water which was used by the family. The girl, Kate Starkey, was taken sick, ten days after Mr. Corkran was up, and died with typhoid in 31 days. James O'Brien, who had been to see the girl Katie while Mr. Corkran was sick, and who drank of the water from the well, was taken sick with typhoid but recovered. The well from which the water for the family was taken is about ten feet deep and is about ten feet from the kitchen door.

At location marked 2. A colored family resides, which consists of father, mother, and six children in age from 3 to 19½ years. The oldest child, Wm. H. Johnson, 19½ years old, was sick with typhoid the same time as Mr. Corkran. Johnson had been in Baltimore City working but had returned two weeks before he was taken sick, and had meanwhile been working on Mr. Coles farm near Lutherville. Johnson was sick for five weeks and recovered.

In reference to drainage, Roland Run passes Lutherville as noted in the map till it crosses the Joppa road, 4,000 feet south of which point it enters Lake Roland. At location 3, on map is a boarding house kept by Mrs. Johnson which has 30 boarders. Refuse matter from this place that does not soak into the soil finds its way back of the dwelling, as noted by yellow lines, into Roland Run. Adjoining Mrs. Johnson's is the Landon House marked 4, which has had about 80 guests during the Summer. The privies here are boxes which are emptied every week, just where, I did not ascertain. The drainage from the pig-pen back of the house, and from the stable with its pile of manure flows by natural drainage, as noted by yellow lines, into Roland Run.

Locations 5, 6, and 7 are stables that find an immediate outlet into the branch of Roland Run which passes under the Rail Road, Location 8, has a cow stable with 4 cows on the immediate bank of the Run, and with a pig-pen about 30 feet from the bank. both of which drain into the Run. Location 9 has six small houses occupied by colored people, each with its pig-pen and privy on the edge of the Run, and in some cases a good size pile of manure from which the rain will take what is soluble directly into Roland Run.

Another pig-pen and a good size pile of manure was found at location 10, which though not directly on the banks of the Run, drains directly into it. At 11 is a large boarding house with a privy well, the overflow from which finds its way, by pipe under the Rail Road and into Roland Run. Location 12, is the Lutherville Female Seminary with about 100 pupils during the school session, and about the same number of boarders during the summer months. The overflow from privy wells passes for a short distance through pipes under ground and then comes out on the surface of the ground and follows the natural drainage, as also. on the other side of the building does the water from wash house, &c. The natural drainage is from the Seminary to Roland Run, passing by where the three Typhoid cases were, and by large pipe under the Rail Road and into the Run.

Respectfully,
WM. P. TONRY, PH.D.,
Analyst and Inspector, State Board of Health.

LETTER FROM ATTORNEY GENERAL WHYTE.

Office of the Attorney General,
Baltimore, August 28, 1890.

Dr. C. W. Chancellor,
Secretary State Board of Health.

Dear Sir—I have received the resolutions of the Executive Committee of the State Board of Health, relating to your Special Report on the dangers incident to the water supply of Lake Roland. The Special Report itself has been carefully read by me, and I have examined a diagram of the locality complained of, and fully appreciate the danger of pollution of the water of Lake Roland, and, consequently, agree with you, that prompt measures should be taken to arrest such a result.

The present Statute law is fully adequate for the emergency. The Act of 1886, Chapter 6, is ample to put a stop to a flow of sewage from cesspools, pig-pens, slaughter-houses and the like into water used for drinking purposes, and to punish by a heavy fine, those who permit sewage to run into the same, and to enable the Board of Health to abate such nuisances. The Act of 1890, Chapter 622, Sections 4 and 6, gives authority to that Board to make all needful regulations respecting nuisances, sources of filth and causes of sickness, &c,, and the violation of these rules is made punishable by fine and imprisonment.

Before proceeding to take measures of a punitive character, I would advise a notification by the Secretary to all persons, whose premises are in a state of nuisance, or whose arrangement for carrying off sewage is open to the condemnation of the Board of Health, under the law ; to remedy the defective condition of things in accordance with the regulations and suggestions of the Board or its Executive Committee, and on a failure to comply with the notice, after a reasonable time given for the improvement to be made, the Secretary should be directed to inform the State's Attorney of the County, whose duty it is to bring the matter to the attention of the Grand Jury, that the offending parties may be indicted and punished.

The abatement of the nuisance can be ordered by the State Board of Health and enforced under Section 6 of Chapter 622 of 1890.

Yours truly,

WM. PINKNEY WHYTE,

Attorney General.

QUARTERLY REPORT OF C. W. CHANCELLOR, M. D., SECRETARY AND EXECUTIVE OFFICER OF THE STATE BOARD OF HEALTH, FOR THE QUARTER ENDING SEPTEMBER 30TH, 1890.

INCREASE OF MORTALITY.

The warm weather and marked changes of the meteorological conditions which have occurred during the quarter ending September 30th, 1890, have caused an increase of the mortality rate as a whole throughout the State. The result of these changes, incident to the season, has been to depress vitality generally and thereby impair the powers of resistance to diseases, so that the standard of the public health has been materially lowered and the death rate proportionately increased.

MORTALITY FROM CONTAGIOUS AND INFECTIOUS DISEASES.

Forty-eight deaths from contagious and infectious diseases have been reported from twenty-nine localities outside the City of Baltimore during the quarter just ended. Of these 23 were from typhoid fever, 8 from diphtheria, 7 from dysentery, 3 from typho-malarial fever, 3 from cholera infantum, 2 from measles and 2 from whooping cough.

In nearly every locality where typhoid prevails, its origin can be distinctly traced to filthy surroundings, and especially to the pollution of drinking water. Without a pure soil there can be no pure water, and we thus understand why it is that a population supplied with drinking water from shallow wells and springs is liable to typhoid fever, unless the strictest care is taken to prevent the pollution of the soil.

TYPHOID FEVER AND RAINFALL.

The oscillation of typhoid fever appears to bear a direct relation to the quantity and character of the rainfall in certain localities where filth from the surface and soil is washed into the water supply. An examination of the mortuary reports of the physicians of the State indicate unmistakably that heavy rainfalls are followed by an increase in the number of deaths from typhoid fever several weeks later, and, necessarily, an increased number of cases. As the disease has a period of incubation from one to two weeks, and, if fatal, is usually so from the third to fifth week, the coincidence above referred to would seem to be something more than a mere chance occurrence. Though the explanation may be something doubtful, the fact remains that in localities having a pure soil the rainfall is insufficient by itself to develop the disease. We must conclude, therefore, that the effects observed are connected in some way with the washing of filth by rapid rainfall into the water supply, or by reflux of foul water from the same cause into cellars, where foul air is generated and subsequently drawn up through the house, and at times into sleeping apartments.

DIPHTHERIA IN HARFORD COUNTY.

Reports of deaths from diphtheria, like those of typhoid fever, have come in from several localities. It is altogether important that local authorities should exercise proper precautionary measures to prevent the spread of this disease, so deadly in its nature, otherwise we may constantly witness such calamities from its ravages as that which recently occurred at Prospect, Harford county. About the middle of June, a child died of diphtheria in Wilmington, Delaware, and upon a certificate furnished by a physician of that city, that the child died of "pneumonia," the corpse was transported into this State by the Philadelphia, Wilmington & Baltimore Railroad Company in an ordinary casket, without metal lining or any antiseptic precautions. On the arrival of the body at Conowingo Station, it was immediately removed to the residence of the grandfather, at Prospect, where the coffin was opened and the remains viewed by the family. In a few days thereafter, there was an outbreak of diphtheria in the house, and in less than a month six or seven members of the family were attacked and five died of the disease in a malignant form. It then spread to other families in the neighborhood.

THE BALTIMORE AND CUMBERLAND WATER SUPPLY.

Although there is a statute prohibiting the defilement of any stream, or any tributary of a stream from which water is taken or used for drinking purposes, there are well-known sources of pollution in the water supplies of both Cumberland and the City of Baltimore, and it is only a question of time when the water supply of these cities may become injuriously effected. Power is given "the State Board of Health, or any local sanitary authority" to order the discontinuance of the act whereby any water supply is fouled. With the approval of the Executive Committee of this Board, I have in several instances endeavored to enforce the provisions of the Act with reference to the water supplies of above-named cities; but the small appropriation made by the Legislature, viz., $1,200 annually, to cover all the expenses of the Board, renders it quite impossible for any extended investigations or work to be accomplished in this direction without municipal aid and co-operation.

The proper protection of the Cumberland water supply would, moreover, require concurrent action on the part of the authorities of two States—Maryland and West Virginia—as the drainage into the supply is about equal from both States. But inasmuch as West Virginia has no statute law bearing upon the pollution of streams, I would suggest that this Board place itself in correspondence with the State Board of Health of West Virginia with the view of securing action by the Legislature of that State for the better protection of the water supply of Cumberland, which, together with that of Washington City, is now seriously endangered by drainage from towns and villages located on both banks of the Potomac river and its tributaries.

But while concurrent action on the part of the two States is certainly greatly to be desired, and would effect much good, a certain amount of pollution, however vigilant the authorities may be, will always exist in water drawn from running streams, lakes or ponds, unless it is thoroughly filtered through some indestructible granular substance, such as magnetic spongy carbon, that will oxydize or destroy the dissolved organic matter.

In England and Germany, where the relations of the water supply to the public health are thoroughly understood, a constant supervision is exercised, and the artificial filtration of water supplies on a large scale has become very general, indeed almost universal. The entire water supply of London, with 5,500,000 of population, is required by Act of Parliament to be filtered before it enters the city mains; and even taking into account the large amount of water used for extinguishing fires, flushing sewers, watering streets, etc., it is found much cheaper to filter the entire supply on the large scale than for each consumer to filter with equal thoroughness his individual portion. Both Baltimore and Cumberland require, and should not be slow to provide, an efficient system of filtration for their respective water supplies. Putting off to a more convenient season that which should be done to-day may be followed by an epidemic, the end of which no man can foretell or its results foresee. An abundant supply of pure water is cheap at any price, and "Millions" to secure it would be better than "millions for defence."

IMPROVED CONDITIONS AT LUTHERVILLE.

An illustration of the good that may be accomplished by making public the sanitary defects of a place is furnished in the case of Lutherville, where gratifying improvements have been made in the sanitary condition of the town since the publication of my special report in August, and a great deal has also been accomplished in the way of preventing further pollution of the head waters of Roland run. Fully 90 per cent. of the objectionable features mentioned in the report have been corrected or are now undergoing improvements, and the place will soon be exceptionally free from unsanitary surroundings. With only two exceptions, the pig-pens and privies that lined the banks of Roland run, and poured their filth continually into it, have been removed or so constructed as to be no longer a conspicuous cause of bad odors in the town, or a source of pollution to the stream. Of the fifteen notices served to abate nuisances and to discontinue any act whereby the waters of Lake Roland might be fouled, only one or two individuals, jealous of their domestic right to poison themselves and "the rest of mankind," if they choose to do so, have failed to comply with the requirements of the notice sent, and proceedings have already been entered against them, according to the provisions of the law of 1890. Chapter 622, as advised by the Attorney General.

ADULTERATION OF FOOD, ETC.

The work of food and drink inspections has been energetically pushed forward in the City of Baltimore, and some of the larger towns of the State. It is contemplated during the ensuing fiscal year to bring, as far as practicable, every portion of the State under the operation of the law, so far as the limited appropriation for the purpose will allow. Thus far the results accomplished have been exceedingly satisfactory. In every case where proceedings have been entered against parties violating the law the Grand Jury has found a true bill, and I am informed by the State's Attorney that the offenders will be speedily prosecuted.

I have been disappointed in not securing the aid and co-operation of the State Live Stock Sanitary Board in the work of inspecting herds, which after conference with some of the officers of the Board I fully anticipated. It is very evident from a number of the samples of milk examined, that inspection should extend beyond the mere testing of the milk to detect adulteration, and should embrace surveillance of the herd. Notice should be taken of the health of the cows from which we obtain milk, and all milk produced from animals out of health, should be kept out of our markets. This could readily be accomplished by aid of the State Veterinary Officers. Every sample of milk taken is subjected to microscopic examination, and it not unfrequently happens, that though the milk may be free from "adulterations," it exhibits abnormal qualities which render it "unwholesome," as a result, generally, of a diseased condition of some one or more animals in the herd. In such cases it would be desirable both for the consumer and producer to have the herd examined by an expert veterinarian, in order that the diseased animal or animals could be designated and separated from the sound animals.

In regard to the character of milk adulterations practiced, I may say that the addition of water and the abstraction of cream comprise the most usual methods employed. A few dealers during the warm weather were detected in adding "preservatives," such as boracic acid, sodium biborate, and alkaline carbonate, but it is believed that the practice has been checked, simply by the "warning notice," which is sent in every instance before legal proceedings are entered. As the work of inspection has progressed the quality of the milk sold in the city has unquestionably been improved.

NECESSITY FOR IMPROVED CATTLE TRANSPORTATION.

The cruelty to animals in transit over railroads, and the consequent iujury to their flesh should be a matter of thorough investigation. It is known that cattle are constantly transported from the West to our market not only in cars overcrowded to suffocation and death, but at times are deprived of food, water and rest for days together, and are, moreover, cruelly beaten, prodded, and otherwise tortured when they fall from exhaustion or become maddened and fractious from ill-treatment. It is estimated that 5 per cent. of cattle annually die on the passage to market from the West, and it is said that even these are sold in our markets, while the cattle that get through alive, for want of food and water and by reason of the cruelty inflicted upon them, come out of the cars full of fever, and many with bruises, sores, and ulcers. These are sold to an unscrupulous class of butchers at a mere nominal price, who dress and sell the meat in our markets for human food. Professor Agassiz calls attention to the dangers arising from the ill-treatment of beef cattle before slaughtering them, and it is unquestionably true that the eating of such meat produces diseases in those who eat it. What can be done as a remedy in this matter? I would suggest that a bill be drafted and presented at the next session of the Legislature compelling railroads delivering cattle in this State to take proper care of the cattle in transit, the same as they are required to do in the case of human passengers, by providing suitable cars, and not overcrowding them. If the Legislature would take the matter in hand, and prevent this cruelty to animals, and the barbarous way of rushing them into our market, some dead and others more dead than alive, it would do more to give us healthy food than all the meat inspectors that could be created. The Paddock Meat Inspection Bill, recently introduced in Congress, provides for the condemnation of diseased animals or carcasses, but not against the ill-treatment of cattle before they are slaughtered. This is a matter that should be corrected by the respective State Legislatures.

Respectfully submitted,

C. W. CHANCELLOR, M. D.,

Secretary and Executive Officer.

QUARTERLY REPORT OF C. W. CHANCELLOR, M.D., SECRETARY AND EXECUTIVE OFFICER OF THE STATE BOARD OF HEALTH, FOR THE QUARTER ENDING DECEMBER 31st 1890.

Although no epidemic has aroused the interest of the public generally, during the last three months, the growth of the Board's influence has been distinctly marked in definite results, attained on behalf of individual communities. With the exception of a rather unusual prevalence of typhoid fever and diphtheria in circumscribed localities, there has been less than the usual amount of sickness recorded for the year 1890. This gratifying result, it is believed, has been due mainly to the well-directed efforts of the Board to protect and promote the public health. The Secretary has made an unusually large number of official visits to different communities of the State, where his services were required, and in connection with these services, it may be mentioned that he has prepared and distributed, on behalf of the Board, during the last twelve months, no fewer than 4500 circulars and pamphlets relating to sanitary measures, which timely warnings have undoubtedly served to guard against much sickness, while a firm but respectful enforcement of the sanitary laws of the State has done not a little to promote our present phenomenal exemption from disease.

THE ADULTERATION OF FOOD AND DRINK.

Much care has been taken to trace, as far as possible, cases of adulteration and the sale of unwholesome food. Warning notices, though not required by the law, have been sent to all parties found selling adulterated or unsound articles, and quite a number have been arraigned for continuing the sale of such articles, after the notices were duly served. It is to be regretted, however, that not a single conviction has yet been secured. Retailers from whom the samples for analysis were obtained have succeeded in escaping punishment by casting the blame upon parties from whom they obtained the goods, and by other pretexts equally flimsy. All sorts of pleas are tendered by those accused, and what to ordinary minds seems the most absurd statements are listened to and accepted. A milk man charged with the usual failing of his fraternity gave as his excuse, that his milk was rather weak because he was in the habit of adding ice to it, in the cans, and produced a customer to testify that he preferred milk served in this way. The pleading was accepted and the man got off. In another case an excuse, and also a successful one, for selling or offering for sale a lot of rotten and unhealthy fruit was that the seller was a widow. It would not be surprising if other enterprising widows should undertake to violate the law on the strength of that decision.

There are, however, two ways in which the crime of adulteration can be met. The dissemination of intelligence bearing thereon, to a degree that shall create a public sentiment that will insure the punishment of all offenders against the law of adulteration, instead of treating them in the most absurdly lenient fashion. So long as men are permitted to consult their own selfish interests with impunity, so long will they continue to raid the pockets and health of the community, in utter disregard of law or life.

Failing to bring into operative force the punitive principles of the law through the Courts, there is another course open to the State Board of Health. The law provides (Section 53): "That the State Board of Health shall be charged with the duty of rendering effective the provisions of the Act, and shall take such steps and do such things as the said Board may deem necessary to detect and *publicly expose* any adulteration or corruption of all articles, solid or liquid, intended or offered for sale as food or drink."

It is believed that a judicious publication of the names and places of business of parties detected in selling or offering for sale any adulterated or unwholesome article of food or drink will have a more restraining influence than the present system of prosecutions, where the burthen of proof, as to the intent of the vendor, is exacted of the Board, in direct contravention of that clause of the Act (Sec. 55) which provides that "the proof of such article not being exposed or deposited for sale shall rest with the party charged."

It is not desired, except as a last resort, to arbitrarily enforce this measure; at the same time it should be clearly understood that it is the intention of the State Board of Health to stand firm as the determined protector of the people against this most iniquitous and inexcusable practice of food adulteration, and in doing so to use every legitimate means at its command; but the efforts of the Board, to be successful, must be seconded by the action of the public themselves, in whose hands the solution of this and all other problems of public policy really lies. If people remain, as they are apparently at present, profoundly apathetic as to the purity of the food they consume, all the analysts and inspectors that can be employed will be insufficient to stamp out the evil; but if these officials be assisted, as they ought to be, by the public generally, so that transgressors may be detected and punished in such a way that adulteration shall cease to be respectable or profitable, then these worst of rogues will disappear, honest men will come to the front, and we shall soon have what every one must admit is of the greatest importance—an abundant supply of really pure food. To accomplish this object it is obvious enough that no other agency is so potent as the public press in arousing and directing public attention and in stimulating public sentiment. A few well-timed words from the press, editorially, will be of incalculable assistance to the Board in its efforts to secure a pure and wholesome food supply for our city and State. It only needs that the public be rightly informed to insure ready co-operation.

DAIRIES AND MILK SHOPS.

There is much room for improvement in the manner in which milk is sold, and the shops in which it is kept. No milk shop should have any connection with an inhabited house, and there should be no possibility of sewer gas reaching the vessels of milk. All milk shops and milk men should be licensed and under the surveillance of the health authorities, as is the case in London, Paris and other European cities. Milk is a sponge and a dangerous sponge. It absorbs at once any deleterious matter and is a prolific culture field for the germs of disease. It is one of the most fertile causes of epidemics.

In a paper by Mr. Hart, read before the Health Department of the Social Science Congress in Glasgow, he analyses 53 outbreaks of typhoid fever, 17 of scarlet fever and 12 of diphtheria due to milk. Mr. Vacher has traced nearly 100 epidemics to poisoned milk. Our dairies and milk shops are, therefore, well worth consideration. Much good would result from a systematic inspection of all dairies by a medical officer, who should be able to put his finger at once on any case of infectious disease occurring in a dairy or milk shop, and have power to regulate or prohibit the sale of milk from such places during the existence of the disease. As it is we may have at any time an outbreak of scarlet fever, typhoid fever or diphtheria originating from infected milk. The inspector should also keep a sharp lookout on the milk carts, and see that they are not used for carrying meat, or removing furniture or baggage, it may be from an infected house, as is sometimes the case.

DISEASED ANIMALS SLAUGHTERED FOR THF BALTIMORE MARKET—AN ABATTOIR NEEDED.

Information was received, through a gentlemen residing in Chestertown, Kent County, about the 30th of November, that "one Jacob Levi," from the city, had been in the county, and was "currently reported to have been buying, slaughtering and shipping hogs to the city infected with cholera, and is in the market for the purchase of diseased stock. A few days ago," continues the writer, "a lot of infected hogs were slaughtered and shipped to Baltimore per Steamer Corsica."

Immediately on receipt of the above information I instituted inquiries into the facts, and directed the Inspectors of the Board to keep on the track of the suspected dealer, and, if possible, secure evidence that would convict him of the charge. Up to this time we have not been able to establish clearly the fact that he sold the meat for human food, but a close watch will be set upon such dealers in the future, both in the counties and the city.

Several anonymous communications have been received charging certain parties in this city with purchasing and having diseased cattle slaughtered and otherwise prepared for human food. Information coming in this way is generally not to be relied on; but in this instance investigation has demonstrated that the charges are not wholly without foundation in fact, and while we are morally certain that the parties suspected are dealing constantly and regularly in diseased and unwholesome meats, it seems quite impossible to secure the requisite testimony to convict them. What we need is a well-regulated abattoir, where animals must be inspected before they are killed, and where all meat brought to the city must pass inspection before it is placed on sale or allowed to undergo preparation for sale in the city markets. Under the present system of individual slaughtering, who knows what kind of animals are killed and supplied to our meat market, or manufactured into "pudding" or "sausage" meat? We have no guarantee that choleric hogs, tuberculous beeves and measly sheep are not killed and sold daily to our people, in one shape or another.

A NUISANCE AT UNION BRIDGE.

Formal complaints have been preferred several times against the slaughter-shop and pig-pen of Messrs. Reck & Smith, in the town of Union Bridge. An inspection of the premises showed that the complaints were well founded, and proceedings have accordingly been instituted to abate the nuisance. An almost invariable adjunct to a village slaughter house is a filthy pig-pen, where the pigs are fed on blood, intestines and other offal. Imagine the flavor of pork fattened on such food! What Dr. Reed says of slaughter-shops and pig-pens generally is literally true in this instance. "Imagine a hog-pen with all its natural odors, to which is added the fragrance of decomposing blood and flesh on one side, a pile of odoriferous bones on the other, and the soil underneath seething with putrefying organic matter, and then imagine such a place to kill and cool animals from which you obtain your choice roasts and tender steaks," that have, perchance, hung for hours in this septic atmosphere. Such nuisances should be banished from every town and village in the State.

QUARTERLY MEETING OF THE STATE BOARD OF HEALTH.

The State Board of Health met at the Office of the Board, No. 12 E. Eager Street, on Wednesday the 11th November. There were present Drs. Piper, Chancellor, Bateman, Morris, McShane, and Mr. J. Crawford Neilson.

The Secretary, Dr. Chancellor, presented his Report for the period ending October 31st, 1891, which was adopted.

DR. CHANCELLOR'S REPORT.

During the summer months the health of the State was excellent, and the general death rate lower than has been recorded for many years. Beginning with the fall months, however, there have occurred numerous outbreaks of typhoid fever and diphtheria, all traceable directly to local causes or circumstances which could have been avoided by a little attention to the most elementary laws of hygiene, which this Board has been trying to inculcate, "line upon line and precept upon precept," for many years.

Notwithstanding the general immunity from disease during the summer months, there was no abatement in efforts to awaken public interest in the progress of hygiene. Many places were visited for the purpose of adding the Board's authority to that of local health officers in abating nuisances. It is not always best to conclude in the absence of epidemics, that there is no use to look for them. During periods of exemption from disease the health officer must be on the alert to discover and remove all causes that may give rise to epidemics. The object aimed at should be to exclude poison germs altogether, but should they enter, attention must at once be turned towards limiting their multiplication and spread in the community.

LET CLEANLINESS BE OBSERVED.

The poison of measles, scarlet fever, diphtheria, typhoid fever, &c., is probably never wholly extinct in any community where these diseases have once prevailed; but their epidemic prevalence only occurs in uncertain cycles when the surroundings are favorable for their spread. Such conditions we must diligently avoid. and of all the means of doing so, cleanliness has been found to be the most direct and trustworthy, People who live in the country or in small towns fancy that they are exempt from the unhealthy conditions of which they read so much in the papers. This is a great mistake. The refuse products of a single family neglected for a few weeks or months, will almost certainly breed mischief, and if neglected for a long period will render the premises as foul as the worst spots of a crowded city.

EVIL EFFECTS OF FOUL AIR.

A tainted atmosphere may be so poisonous that very little introduced into a bed-room, so little as to be quite imperceptible to the nose, may give typhoid fever, diphtheria, or scarlet fever to a person sleeping there. The disease germ contained in such an atmosphere is a spark, the effects of which may be unlimited. We do not content ourselves with excluding the great majority of sparks from a powder magazine, we do our best that not one shall enter. So our endeavor must be that no tainted air shall exist around or in our dwellings. Nothing perfectly clean can contain a germ of disease. Although perfect cleanliness may be an unattainable ideal, still it is an ideal after which we should strive, since the conditions of health in a house depend for the most part on absolute cleanliness. Pure air, clean water, rapid removal of all refuse or foul matters, are the great desiderata for a healthy home, whether in the city or in the country.

POLLUTION OF WATER SUPPLIES.

Foul matter is bad enough when conveyed into the system with the air we breathe, but its effects are more deadly when it is taken into the system with the water we drink. It is, therefore, a first duty to see that the sources from whence we draw our drinking water are so arranged and protected that under no circumstances can they be polluted by farm yards, cesspools, sewers or drains.

In cities sanitary officers are supposed to stand as watchful guardians over the water-supply. In country districts the conditions are quite different, and typhoid fever, dysentery and other zymotic diseases appear with the same regularity as the seasons, and generally with the variability of the water supply. Well water is almost invariably contaminated, and frequently the peerless spring may bubble forth in a stream of clearest crystal water, and yet be so laden with poisonous microbes as to become the purveyor of germs of disease and death. In view of the fact that so many springs and wells are liable to contamination, it may be asked, "How then do we enjoy such good health?" The answer is: "Because nastiness is not always poison." Organic matter in water is not in itself poisonous; if it were, a cup of bouillon or a glass of cider would be deadly. Even putrid organic matter is not in itself poisonous when eaten, or some delicacies, as "high game" and Stilton cheese, would be fatal. For years we may continue to drink diluted sewage, to breathe the exhalations from many thousand privy pits, and be only a little the worse for it; but let the epidemic once come, let the poison germ be once introduced, and we will then see how much the old boast will be worth. that "people have drank these waters and breathed these exhalations, and lived healthfully enough for many years."

HOW DISEASES ARE COMMUNICATED.

The most positive evidence exists that some of the most fatal diseases are contracted by drinking water or milk over which tainted smells have passed, as well as into which sewage matter has drained. The quantity of foul-smelling air required to taint an article of food or drink is extremely small when real poison germs are present, and vessels containing such articles should, therefore, never be left in a sick room or in an impure atmosphere, but should be placed in halls or rooms remote from impurities. Any one may see how readily liquids absorb deleterious matters from the air, by placing a pail of water in a room freshly painted; in a few hours the pail will be covered with an oily scum drawn from the atmosphere of the room. Napoleon at St. Helena, said: "Life is a fortress which neither you nor I know anything about. Water, air and cleanliness are the chief articles in my pharmacopœia." These, indeed, may be said to be in a general way the triple alliance upon which rests the foundation of health and life.

HOW TO DISINFECT WELLS.

It is an established fact that typhoid fever and cholera are disseminated by germs (bacilli) which enter the water supply, usually by means of drainage from the excreta of human beings affected with the disease. The majority of wells in towns and villages, and connected with farm houses are usually in dangerous proximity to sources of contamination, and becoming infected they are a constant menace to health. It is advisable, whenever there is an outbreak of typhoid fever in a family using well water. where other water cannot be obtained, to use special means to purify such well, (1) by eliminating every source of contamination, and (2) by disinfecting the well itself. This may be done (a) by throwing into the well from ten to twenty pounds of chloride of lime, according to the size of the well and the depth of the water in it; (b) when such disinfection has taken place, and within two or three days thereafter the well must be completely cleaned, and then within two or three days thereafter disinfected anew, by throwing into it ten or twenty pounds more of the lime, and, subsequently, after a couple of days pumping out all the water. After this treatment, in most instances, the water may be used with impunity. It is important also to disinfect by a similar process all cesspools or other sources of possible contamination, in order that the lime may percolate the same soil through which the drainage into the well has passed.

THE ADULTERATION OF FOOD.

Considering the opportunities, some good work has been done in food inspections; but it is evident that the sophistication of articles used in the every day diet of vast numbers of people has grown, and is now practiced to such an extent as to seriously endanger the public health, and to call loudly for a repressing hand. In dealing with this evil the State Board of Health has been greatly handicapped by a want of sympathy on the part of the legal tribunals before whom offenders have been tried. Not a single conviction has been obtained, though the violations of the law have been frequent and of the most flagrant character. Surely, if there exists a right which may be declared inherent, sovereign, it is the right of individuals and communities to know the character of food they consume; the right to demand fair dealing in the sale of every article of diet; to require that it shall emanate from a healthy source, shall be untainted and free from adulteration. This principle is based upon the fundamental law of self-preservation, and should be paramount to the selfish interests of any class or trade.

It is not intended to charge any special class or occupation with a tendency to dishonesty, but the evidence obtained clearly indicates that unless the utmost vigilance be exercised, and violators of the law be held strictly amenable, the people will be at all times at the mercy of dealers who, with some honorable exceptions, do not fail to take every advantage which the ingenuity of dishonest cunning can devise.

BETTER MILK NEEDED.

A number of arrests have been made under the provisions of the law to prevent the adulteration of milk, and though no convictions have followed, the results have been very encouraging, both to the consumer, and to the farmer who sends the milk to market. In the large majority of cases, the adulteration is done by the retail dealer, and more particularly by the men who sell milk from wagons, delivering it at the house. Among those engaged in the milk business, it is proper to state that there are many who are disposed to do what is right, and who would gladly comply with a proper system of sanitary measures, but who have no encouragement under the present practice of letting every offender go "unwhipped of justice." Such a practice is discouraging to honest enterprise and destructive to a legitimate dairy business.

WATER THE CHIEF ADULTERANT.

In a large number of the specimens examined by the Board's Analyst, from retail dealers and milk carts, the examination showed that much of the milk sold is heavily watered. Some of the specimens contained as much as 33 per cent of water. Sixty-seven gallons of milk raised to one hundred, by the addition of water? Is not this act in every respect as culpable as that of a tradesman who makes use of false weights, or the man who passes counterfeit money?

It is a fact susceptible of demonstration, that the people of Baltimore pay annually for water, often impure and dangerous, which they purchase as milk, believing it to be milk, more than $500,000 annually. Until the poople of Boston took this business into their own hands, and brought the milk trade under the rigid surveillance of the law, they were similarly defrauded; and when the citizens of New York were led by startling disclosures to investigate their milk supply, they discovered that more than 100,000 quarts of water were added to their milk supply daily, or nearly 37,000,000 quarts in one year.

LOOK OUT FOR SMALLPOX.

Epidemics of smallpox travel in cycles, reappearing with considerable regularity about every eight or ten years, or whenever, by the failure or neglect of the people to have their children vaccinated, and to be themselves revaccinated, an abundance of material is supplied upon which an epidemic may feed. Nearly ten years have elapsed since this State was visited by an epidemic of smallpox, and of the one hundred thousand births, as near as may be, which have occurred in the State during that time, outside the city of Baltimore, it is safe to say that less than fifty per cent. of the children have been properly vaccinated, and a much larger per cent. of adults have failed to avail themselves of the protective influence of revaccination. We may roughly estimate, therefore, that more than one hundred thousand persons in the State of Maryland, exclusive of the population of Baltimore, are at this time unprotected against the poison of smallpox, and would almost certainly take the disease should they be subjected to its contagion, a circumstance not improbable, to a certain extent, since reports from a number of the States and from several localities show that the disease exists and is spreading within their borders. By the law of this State vaccination is made compulsory. Every parent or guardian is required, under a penalty of ten dollars for every neglect to have his or her child vaccinated within six calendar months of its birth, and the vaccination should be repeated every five years throughout adult life. The prime object of the compulsory law is to make sure that communities are protected against one of the most loathsome of diseases, and that interruptions to all kinds of business may be avoided.

Under the beneficent law of Germany making vaccination compulsory, and providing for revaccination at stated periods of life, smallpox is almost completely exterminated from the German Empire. We Americans do not long for the paternal arm of a monarchial government to be thrown around us, but there are still lessons for us to learn of the value and sacredness of human life and of the duties of free republics in guarding it.

Respectfully submitted,

C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

Report on the Prevalence of Typhoid or Entero-Miasmatic Fever at Cumberland, Md., by C. W. Chancellor, M. D., Secretary of the State Board of Health.

To His Excellency, the Governor of Maryland:

On the 6th day of February, 1891, the following letter was addressed to me as the Executive Officer of the State Board of Health:

"Cumberland, Md., February 6th.

"To Dr. C. W. Chancellor,

"*Secretary State Board of Health:*

"The undersigned citizens of Cumberland would respectfully request that the State Board of Health make a thorough sanitary and scientific inquiry into the cause and progress of the fever which has prevailed in this city at intervals for the past twelve months, and take such steps and do such things as may be deemed advisable to arrest and permanently free the town from the said disease, which, it is believed, is dependent entirely on local causes that can be ascertained and overcome.

"(Signed)

W. M. McKaig (*Mayor*),
David B. Sloan (*State's Attorney*),
James P. Gaffney (*City Engineer*),
M. A. R. F. Carr, M. D.,
Thomas M. Healey, M. D.,
C. H. Ohr, M. D.,
Lloyd Lowndes,
I. Smith Johnson,
Theo. Luman,
Robert R. Henderson,
D. J. Blackiston,
D. Annan,
H. Virgil Porter, M. D.,
R. Cleary,
Henry Jandorf,
D. C. Miller,
R. D. Johnson,
Robert McDonald,
James Clark,
Benjamin A. Richmond,
A. Hunter Boyd."

Your Excellency having approved this proposal, I thereupon received my instructions from the State Board of Health, and commenced the inquiry on Monday, the 23d day of February, 1891, with the following assistants: Professor William P. Tonry, Ph. D., Chemist; C. O. Miller, M. D., Bacteriologist; R. C. Massenberg, M. D.; Henry S. Jarrett, M. D.; L. Caskin, M. D.; William S. Tonry, and G. R. Godman, Inspectors.

From the nature of the inquiry it was necessary to make a house-to-house inspection in systematic order, and to visit various kinds of business establishments, especially such as produce effluvium nuisances. The magnitude and difficulties of the inquiry were obvious as soon as it was fairly entered upon, and a considerable number of houses were necessarily passed over, but I think it will be found that the most important parts of the city have been investigated.

The investigation, though instituted in regard to the cause and prevalence of the disease, was also concerned in part with the general sanitary circumstances of the place. In this connection I must express my obligations to Mr. James P. Gaffney, City Engineer, for valuable assistance in various ways. I am also indebted to Drs. Carr and Healey for much information as to the incidence and spread of the prevailing disease, and to Mayor McKaig for co-operation in distributing notices to abate nuisances, and for supplementing the same with a circular note, in each case urging prompt compliance with the orders of the State Board of Health.

BEGINNING THE WORK OF INSPECTION.

As a preliminary to the inspection the following circular, under date of February 20th, 1891, was distributed by being left at each house in the city:

"To the Citizens of Cumberland:

"The prevalence at this time of a fatal form of fever which has existed in your city at intervals for more than twelve months, has induced a number of prominent physicians and citizens to call upon the State Board of Health to adopt such measures and do such things as may seem proper and necessary to improve the sanitary condition of the place.

"Acting under the provisions of Article XLIII, Section 3, of the Code of Public General Laws, the Board, with the approval of His Excellency the Governor of the State, has accordingly directed me 'forthwith to cause all needful sanitary measures and precautions to be taken which the emergency may call for, and which may be consistent with law,' in order to abate existing sanitary evils and restore the salubrity of the community.

"To this end you are hereby notified that a force of inspectors will be at once applied to the work of making a careful investigation of the insanitary condition of every street, alley, house and premises. It is earnestly hoped that the citizens generally will aid and facilitate the inspectors in obtaining an accurate knowledge of the defects and evils which is the first step toward their remedy, and thus co-operate with the Health authorities in the effort to limit the progress of disease and death.

" Your attention is especially called to the necessity of promptly abating all nuisances existing on your premises, such as filthy privies, vaults, cesspools, slop-holes, pig-pens, stables, slaughter-houses, and wet, mouldy cellars or basements. Such sanitary work by individual owners or occupants of property having been accomplished, it will only remain for the authorities to determine what further action if any, is necessary.

" In the absence of sewers, the best that can be done will be to construct surface or tile drains for liquid matters to the nearest natural drainage, as by a ravine or water course, which should be kept free from solid filth, garbage, &c. Such matters should be properly taken care of by individual householders, and removed at short intervals by the city.

" Duty to the community demands that every owner, agent or occupant of property shall see to it that his or her premises and surroundings are placed and kept in the best attainable sanitary condition, otherwise formal notice will be served on delinquents and the penalties of the law enforced.

"C. W. CHANCELLOR, M. D.,
" *Secretary and Executive Officer.*
" *State Board of Health.*"

BLANKS FOR HOUSE-TO-HOUSE INSPECTION.

The necessary blanks for house-to-house inspection were printed and bound in books with flexible backs, each containing fifty sheets. These measured six by nine inches and are as follows :

No. —. STATE BOARD OF HEALTH. 1891.

1. Ward ——; street ——; No. ——.
2. Owner or occupant ——.
3. Area of lot ——; of house ——; out-houses ——.
4. Age of house ——; material ——; number stories ——.
5. Cellar and basement ——.
6. Rooms and passages ——.
7. Sinks, drains, and cesspools ——.
8. Privies or water closets, location and condition ——.
9. Yards, condition ——.
10. Hogs ——; horses ——; cows ——; fowls ——.
11. Public nuisances on or near premises ——.
12. Number families in house ——; names of heads of families ——; number of persons in each ——; white ——; colored ——.

13. Sickness now in house ——; what disease ——.
14. Any sickness during past year ——; what disease ——; number cases ——.
15. Deaths during past year ——; what disease ——.
16. Water supply ——; sources of contamination ——.
17. Milk supply ——.
18. Sanitary needs ——.

The above is correct as personally examined by me this — of ——, 1891.

—— —— ——.

Inspector.

In the front of each book specific directions for filling blanks were printed, and the inspector requested to refer frequently to the instructions.

The following notice was served during the progress of the inspection to each occupant or owner of premises on which nuisances were found to exist :

EXECUTIVE OFFICE,
STATE BOARD OF HEALTH,
CUMBERLAND, —— ——, 1891.

To —— ——:

In compliance with an order of the State Board of Health, approved by His Excellency the Governor of the State, directing a careful and thorough sanitary inspection of the town of *Cumberland*, I have so far made the required investigation as to find that a nuisance, consisting of —— —— exists, on your premises, and you are hereby notified to abate the said nuisance and place your premises in good sanitary condition without delay. A failure to comply with this notice within —— days from its date will render you liable to prosecution under the Sanitary Laws of the State.

C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

After a general survey of the city and obtaining information from the authorities and principal citizens of the place, and after an examination of the results of so much of the house-to-house inspection as was completed on the 11th of March, I presented a preliminary report addressed to Mayor McKaig, of which the following is a copy:

PRELIMINARY REPORT OF THE SANITARY CONDITION OF CUMBERLAND, MARYLAND.

State Board of Health,
Secretary's Office,
Cumberland, March 11, 1891.

To Hon. William M. McKaig, Mayor :

Dear Sir—In view of the great desirability of taking immediate precautions to improve the sanitary conditions of Cumberland, I would respectfully offer the following suggestions as preliminary to my official report which may not be published for some months to come, premising that I do this with a full appreciation of the difficulties and drawbacks under which the city has heretofore labored, and must continue to labor unless a strong code of health laws is enacted by the municipal government.

After a partial survey of the city, and an examination of the results of so much of the house-to-house inspection as has been already completed, I have, in view of the urgency of the case, decided to furnish you this preliminary report, together with such recommendations as are deemed important to be adopted at once for the better sanitary government of the city.

The inquiry was instituted, as you are aware, at the request of a number of prominent citizens and physicians, to ascertain, if possible, the cause of the unusual sickness which has prevailed at intervals in this city, with more or less fatality since the middle of December, 1889. The inquiry is also concerned in part with the general sanitary circumstances of the place, but it has been conducted with special reference to the incidence of the prevailing disease.

That the existence of this disease is in some way associated with certain unsanitary conditions, as cause and effect, cannot be doubted, but it is quite impossible to make public, at this time, all the facts upon which a final conclusion will be based, as the data have not yet been fully collated and studied. This much may be premised, however, that in respect of particular cases there are conditions or circumstances existent which might suffice to explain the occurrence of the disease independently of any peculiar water supply—conditions which can be readily corrected. The entire absence of a uniform method of sewage disposal makes Cumberland essentially a city of cesspits and cesspools. These are usually situated in back yards, or gardens, and sometimes in close proximity to or under dwellings. Besides these disease engendering reservoirs, there are in various parts of the city old drains, nominally for carrying off storm water, but which in some instances receive in addition excremental matters from the houses near or beneath which they pass. Surface channels exist in most streets for carrying off storm and slop waters, all of which are finally discharged into one or another of the several water-ways which pass through the city.

The conveniences which exist for the deposit and final disposal of excremental matters are very limited and exceedingly primitive, and so varied as to defy all attempts at definite classification. In a majority of cases the arrangements consist of privies with or without pits. In many such privies, the excrements being under cover, yet exposed to the winds, are soon desiccated and become the sport of every passing breeze. The system, if it may be so termed, of removal is a sort of "do as you please" method, and the stuff is removed or not as suits the convenience or fancy of the owner or occupant. Again, the privy pits are for the most part dug in the ground, without being cemented on sides or bottom, so that the liquified contents are constantly soaking into the soil, and in many instances pass through the foundation walls of houses into the cellers. In comparatively few houses the water closet system is in operation, the soil pipe discharging on an open surface, or into a drain having its outlet in the river, creek or race In a few instances there are absolutely no special conveniences, the male members of the family resorting to a shed or any convenient place, the females using chamber vessels, which are empted into one of the natural drains of the town, or on to a pile of rubbish or manure in the garden or stable yard.

It is stated that water-closets have of late years replaced a number of the old privies. However this may be, it is certain that cesspit privies, and privies discharging directly into the creek or race still exist in large number. In the absence of any proper system for the disposal of excretal sewage, it may be questioned whether replacement of cesspit privies by cesspool water-closets be, in a sanitary sense, improvement. Such replacement generally results in a multiplication of an increase of size of such receptacles, and of storing, therefore, a greater amount of matters dangerous to health, for here, as elsewhere, the frequent emptying of water-closet cesspools would prove a costly process. And in regard to non-water-tight cesspools, they facilitate soakage of the contents into the soil, and thence to wells and water supplies. Moreover, it is in many instances substituting for an out-door water privy, with but small capacity for mischief, an in-door water-closet more dangerous because destitute of proper provision against admission of cesspool air into the dwelling.

In regard to the disposal of other solid refuse, such as ashes, garbage, &c., these matters are generally piled up in the back yard, or dumped into any convenient alley. There is no system of removal, and when allowed to accumulate such matters have to be removed at the expense of the owner or occupant of the house at quadruple the expense it would cost to remove them by a well-organized system under the control and direction of the city. Night soil is only removed by arrangement of the occupiers or owners of property, and often accumulates to the extent of creating an insufferable nuisance. As to slop refuse, it is cast into back yards, privy pits, surface channels, streets or alleys, or directly into one of the waterways traversing the city. There is no system of house drainage, and many cellers are constantly filled with water; indeed, a dry celler in Cumberland may be said to be exceptional. Many of them are without proper ventilation, dark, damp and mouldy, and not a few contain putrefying organic matter and all manner of debris that emit unhealthy emanations.

There are two natural drains traversing the city from northwest to southeast—"Will's Creek" and "The Race;" the former empties into the Potomac river above the dam opposite the city, and the latter passes into what is known as the canal basin. These two streams, that should constitute a feature of health and beauty in the city, have been converted into elongated cesspools into which is cast, day by day, the most obnoxious filth. It is entirely practicable to follow the movement of the refuse matters thrown into these streams, consisting of dead animals of all kinds, the blood and offal, including entrails from several slaughter-shops, and of a large amount of fæcal matter and household wastes. It is no exaggeration to say that they carry at all times much floating nastiness, part of which is necessarily deposited on the banks and bottom before reaching the river or canal. It has been stated by a number of citizens that at times during the summer much disengagement of fœtid gas from the waters of these two streams in their respective courses through the most populous parts of the city is observed, particularly when the water is very low, and the mud on the bottom is exposed to the heat of the sun's rays.

It is not necessary to say much in demonstration of the nuisance arising from the keeping of pigs, a great many of which are to be found in Cumberland, not only confined in pens, but running at large on the streets, Pig keeping is a notorious nuisance, and should not be permitted in any city, town or village. Still, as a matter of fact and daily observation, pigs are habitually kept in the middle of populous towns, in a most uncleanly and unwholesome manner, and the outcry against their being so kept in a city, the size and importance of Cumberland should be persistent and deafening, until the evil is driven from the city by public sentiment, if not by public statutes.

The trade of "fellmonger" consists in receiving the skins of sheep and the hides of other animals, and in preparing them for the use of the leather dresser. Such establishments, of which at least three exist in Cumberland, are usually a source of nuisance to the immediate neighborhood, especially to persons residing in houses adjoining or opposite. Serious complaints are made of the effluvia arising from the establishments located on Centre street, and certainly the trade has been carried on in the roughest manner and with the least regard to tidiness and cleanliness. This is entirely the fault of the persons who carry on the trade, and unless it is corrected at once these establishments should be removed beyond the limits of the city.

The effluvium nuisances arising in connection with slaughtering animals are usually confined to the immediate neighborhood. They may depend: 1. On the uncleanly manner in which animals are kept prior to being slaughtered. 2. On the uncleanly condition of the slaughter-house, or an uncleanly mode of conducting the several processes of slaughtering. 3. On the retention and accumulation upon the premises of hides, skins, blood, fat, offal, dung and garbage, which undergo decomposition and become offensive. 4. On the uncleanly condition of receptacles either kept in the slaughter-house or in the yard, &c. The utmost care is necessary to prevent a slaughter-house, in a populous neighborhood, becoming a nuisance.

It is gratifying to note that a second visit paid to several of these establishments, after notice was served, showed a manifest improvement in their condition, and the proprietors evinced every disposition to maintain them in proper sanitary condition. This was especially noticeable in the slaughter-house and premises of Mr. Blaul.

In regard to premises generally, a few of the chief facts reported by the several inspectors will be as much as can be cited in this preliminary report. They are as follows: "Unwholesome condition as regards dwelling—water supply suspicious—excrement disposal and drainage of premises need attention." "Privy accommodation insufficient—water supply greatly exposed to pollution—sanitary state of premises generally bad." "Cesspool and well in close proximity and no doubt intermingling through the soil—sink and slop drain in connection with cesspool—excremental fouling of air, earth and water." "Dirty water in celler from race, the banks of which are constantly fouled by human excrements." "Absence of proper means of sewage and drainage." "General nuisance from accumulation of manure and an offensive cesspool in the yard." "Water-closet trap found chocked and filthy owing to absence of proper means of flushing." "Pig-pen in filthy condition, with escape of foul air into surrounding dwellings." "Public school-house on ——— street badly ventilated, privy arrangements defective and very filthy—more than 50 per cent. of puplis not vaccinated."

The above will serve to indicate the general character of the nuisances reported. I could continue the list of such nuisances existing on nearly 1,000 premises, but enough has been given to show the general character of the sanitary evils existing in the city. A more detailed account will be furnished in the forthcoming official report of the State Board of Health.

To overcome the existence and future recurrence of these great evils it will be necessary for the city to establish a through sanitary code, and live up to it. The draft of such a code is herewith presented, and its adoption may be regarded as the first step towards improved sanitation, and is among the most important duties of a municipal government.

I would especially call attention to the necessity of maintaining a Board of Health organized upon an active working basis, and under whose authority vigorous measures of prevention may be pursued. Such measures should never be left to irresponsible individual application. The necessity of creating and maintaining such a Board of Health in every city and town is often too lightly regarded by the public. At a time when general health prevails in a community the thoughts of men are not commonly turned towards prevention for disease "Sufficient unto the day is the evil thereof" is a doctrine which, however wise it may be in some of the affairs of life, has often been productive of the most lamentable consequences. When the enemy is at the gate there is little time for measures of defence; when epidemic disease appears, snatching our loved ones from the family circle and spreading dismay over hearts unused to fear—such a time is inauspicious for preparation to meet and vanquish the fell destroyer. Better far to maintain a proper organization at all times, and remove in anticipation the causes, more or less prevalent in every community, which invite disease, than wait until the Angel of Death is already on the threshold.

To this end the City Board of Health should have as its executive an efficient health officer, who should be a well-educated physician, interested in sanitary matters and well informed in sanitary methods. There is work enough in any community to occupy a wide-awake and appreciative health officer for a considerable portion of his time. The great mass of the public are negligent of sanitary concerns. Filth accumulations in public and private places, privies and cesspools become foul and offensive drains choked up, leaky or otherwise defective, wells and water supplies are thoughtlessly located so as to receive by percolation or direct flow the contents of privy pits and vaults, the soil itself becomes polluted by steady and uninterrupted accessions from these and other sources, and in turn pollutes the air, which rises therefrom into the dwellings of the people—all these are recognized causes of disease, and constitute subjects to which the attention of a health officer may be profitably directed.

That epidemics may be averted by the adoption and enforcement of timely and judicious measures of prevention, it would not be difficult to demonstrate. Their germs cannot live and bear fruit in an inhospitable soil. As wheat perishes from drought so the living principle by which epidemic disease is propagated often dies out when deprived of the nourishment afforded by insanitary conditions. But the latter are essentially under the control of human agency. A single case of smallpox introduced into a community, if left to itself, will mutiply indefinitely among the unprotected; but the timely application of vaccination will confine it to its original limits—strangle it in the home of its birth. The same may be assumed of other diseases, as scarlet fever and diphtheria, which are readily stamped out by cleanliness, isolation and disinfection.

In thus presenting the subject to the consideration of the municipal authorities and the people of Cumberland, I am actuated only by a desire to awaken such an interest in the sanitation of the city as may lead to practical benefit, and to enlist the co-operation of the authorities in what is believed to be one of the most important duties imposed upon them in their official capacity.

In promoting an object so essential to the general welfare, the State Board of Health will at all times hold itself in readiness to render any assistance in its power.

Very respectfully,
C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

This report was accompanied by the draft of an ordinance, entitled "*An ordinance to more effectually* *promote the health, comfort and prosperity of the City of Cumberland,"* which His Honor the Mayor was requested to bring to the attention of the City Council, and ask that it be passed, with such amendments as might be deemed proper, in order to secure the object set forth in the title.*

LOCATION, AREA, POPULATION, &C.

Cumberland is situated in an alluvial valley among the foothills of the Alleghanies, at the confluence of Wills' Creek with the North Branch of the Potomac River, in latitude 39° 39′, longitude 78° 45′. The city limits embrace two square miles of territory, equal to 1,280 acres, with a population (census 1890) of 12,729 persons, living in about 2,500 houses, many of which are very small and indifferent. A few houses extend up the rising ground formed by the hills on the northern and eastern slopes of the valley. The mean summer temperature for the past 20 years has been 70° Fahr.; mean winter temperature, 30° F.; mean annual temperature, 52° F. The average rainfall for the same period has been 32 inches, but that of 1889 was 40.17, and for 1890 it was 53.47.

GEOLOGICAL FORMATION AND TOPOGRAPHY.

The median white sandstone, the Clinton shale and Fossil ore, the water-lime, and Niagara limestone and Oriskaney sandstone all have their outcrop in the western portion of the city, west of Wills' Creek. The city on the eastern side is surrounded by high hills composed of Hamilton shales and sandstones, while underlying the central, or level portion of the city, at various depths, the Marcellus shales are found. Wills' Mountain, immediately north of the city, is 1,500 feet above mean tide, or 850 feet above the lowest level of the city. Shriver's Hill, east of .the city, and partly comprised within its boundary, is 450 feet higher than the river. McKaig's Hill, also on the east side, and partly within the city limits, is 300 feet above the river. The highest point of the city, west of Wills' Creek, is about 150 feet above the river. The central or depressed area of the city is about 640 feet above mean tide, and from fifteen to twenty feet above the river.

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* Since the above was written it is stated that the ordinance above referred to has been rejected by the City Council, and no measures have been adopted to carry out the suggestions contained in the report.

WATER SUPPLY.

Cumberland is supplied with water mainly from the Potomac River by direct pumping, and also from shallow wells and springs. The water works were built in 1870–1 by the city, enlarged in 1873, and supplied with new pumps in 1880. The daily capacity of the pumps is 2,000,000 gallons, and about that quantity is consumed.* The Baltimore and Ohio Railroad shops and buildings are supplied from works of their own, the water being drawn also from the river; but below the dam which spans the river at a point opposite Cumberland. This dam is the catch basin for a large portion of the filth of Cumberland, carried into it by Wills' Creek and Sulphur Run, which form the two principal drains of the town. In many instances, as will be seen further on, privies are built over these streams, and every sort of filthy and decaying matter, which if used as manure would fertilize the earth, is mercilessly dumped into them, and passes directly into the dam below the intake of the water-supply.

Until within the last year the city water-supply was pumped directly from the river, at a point below Sulphur Run and only a short distance above the entrance of Wills' Creek. It was then ascertained that a number of persons who used the water were subject to affections of the bowels, and in some instances to a low form of fever. Now the water is taken from the river at a point about 900 feet above Sulphur Run, and is, of course, considerably purer than formerly; but the fact should not be lost sight of, that the sewage from towns, villages, farm-yards, stables, slaughter-houses and pig-pens, and the refuse from factories and other decaying rubbish is often turned into the Potomac above Cumberland, without any regard to the well known fact that hundreds of people must drink this water or none at all. It has been stated that pestilential diseases are God's punishment for the wickedness and folly of the people who violate the common laws of health by permitting such a state of things to exist, and it may be that Cumberland has suffered from the "wickedness and folly" of neighbors higher up the river.

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*This indicates an enormous waste of water, occasioned no doubt by leakage from the mains and service pipes, which saturates the soil and keeps the cellars more or less filled with water. Fully two-thirds of the water pumped goes to waste.

But to look "at home." A group of slaughter-houses, tanneries, hide-dressing establishments, stables, pig-pens, privies, and what not, are constantly discharging blood, offal, and refuse of every kind into the Wills' Creek, which empties into the river *above* the dam, and only a few hundred yards below the intake of the present water supply, consequently in dry weather, when the water does not flow over the dam, it is converted into a semi-stagnant pool or catch basin for all manner of filth. Again, when the river rises to a certain height above low water mark, it is "backed up," and it is more than probable when this "backing up" occurs the foul matters at the bottom may be carried up to the intake of the water supply, and from thence distributed throughout the city.

It should be added, however, that this theory as to the pollution of the water supply, and the consequent increase of the prevailing fever during the winter and spring months, lacks the confirmation of personal observation, which it would require considerable time and great care to make. It is nevertheless obvious, that any considerable rise in Wills' Creek will carry with it the the contents of the creek into the dam, and it is not at all improbable that an upward current or eddy would be created by the mingling of the waters of the two streams, which might carry such contents up to, or above, the point at which the intake pipe receives the water from the river. Such a condition can only exist when to a suitable stage of water in the Potomac shall be added a downpour of rain, confined principally to the water-shed of the creek heavy enough to swell the volume of water in the creek sufficiently to overcome the fall in the river from the mouth of the intake pipe to the mouth of the creek. Remote as such a coincidence would seem to be, it may nevertheless occur at particular seasons of the year. There is, however, reason for believing that under certain conditions the surface water of the dam is carried up stream for a considerable distance, even when the deeper water is flowing out. Whether this ever occurs to such an extent as to carry the foul waters of the creek and Sulphur Run up to the entrance of the inlet pipe, I would not presume to assert.

The details of the river water supply above generalized, will be embraced in special reports by the Chemist and Bacteriologist, herewith transmitted.

A good drinking water should be free from all suspended matters, and as far as possible free from dissolved organic matters. The best water for drinking or dietetic purposes is that which is mingled with pure air, which is free from any organic animal or vegetable matter, either solid or gaseous, and which does not hold in suspension or solution any considerable quantity of mineral matter. Such ideal or chemically pure water is rarely if ever found ; but with this as a standard, we can define those departures therefrom which are beyond the bounds of safety.

"Much water," says Dr. Hunt, "is constantly being used which is contaminated by sewage or other organic impurities, It does not always do appreciable harm, because our systems are so constructed as to adjust themselves to a certain degree of irregularity, and to resist slight or ordinary embarrassments. There is another reason. Nature, chiefly through the action of the air mingled through or dissolved in the water, is constantly transforming that part of the organic or decayable matter which is carbonaceous into carbonic acid gas, and the harmful nitrogenous matter into insoluble nitre. Both of these, to the degree thus produced, are harmless. It is when this process is interrupted, or when the amount or kind of matter is such as not to admit of sufficient neutralization by these methods, that decomposable matters remain in the water, ready to act as fertilizers for forms of minute life so threatening to the higher life of man. The danger is, that in certain special conditions of atmosphere or temperature or locality, or of our own bodies, this organic matter will be roused into some peculiar or more rapid decomposition, and that some form of that disease, breeding animal or plant life, will from it obtain abnormal cultivation which will excite disease. This may take the general form of *irritation*, such as will produce *non-specific* disease, or it may prove *specific* in its character, and we then have cholera, typoid fever or some other deadly plague." *

WELLS AND SPRINGS.

As stated in a special report made a few years ago on the water-supply of Cumberland, the wells of the city are for the most part superficial, and the depth of water varies in them considerably during the season.

The natual condition of the soil and sub-soil are such as readily to admit water contamination from surface pollution, both in the wells and flowing springs of the town. The soil being porous, and the water bearing level of fissured limestone or slate, whatever falls upon the surface, or into privy pits or cesspools, percolates the soil until it reaches the hard stratum or fissures of the rock below. and then flows by gravity into wells or springs. In this way the contents of such receptacles, and other filth find ready access into these sources of water supply.

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* Hunt's Principles of Hygiene, p. 37.

Experience has taught us that water drawn from a soil thus polluted is never safe for drinking or dietetic purposes. The researches of Rodet and Roux (*Comptes Rendus Hebdomadaries des Seances de la Societe de Biologie*, February 21st, 1890), have led them to conclude that the typhoid bacillus of Eberth is nothing more than a modification of the bacillus *Coli Communis* in a state of disintegration, and that this bacillus acquires its virulent features outside of the body. It follows, therefore, that water contaminated with fæcal matter, not necessarily typhoidal, or by a soil saturated with such matter, may give rise to typhoid fever, but this view is not generally accepted by bacteriologists.

In 1881, the late Dr. D. P. Welfley, a painstaking physician of Cumberland, furnished the State Board of Health with an interesting paper on the water supply of the town, containing analyses *of different waters then used*. "Of the seventeen wells and springs examined, three were unconditionally 'condemned,' six were declared 'unwholesome,' and six 'suspicious,'" while only two were represented to be fit for use. More recent investigations have demonstrated very clearly that the pollution has gone on to increase until *there is not now a well or spring in the thickly settled parts of the town free from dangerous contamination*.

The most erroneous ideas in regard to the liabilities of wells to contamination prevail among the people. Those who are familiar with the principles of underdrainage by means of porous tile drains, know that when they are laid horizontally in the earth the water will find its way for quite a long distance on either side of them and through their pores; yet they are only small vent places in the earth of only a few inches in diameter, while a well is a large and deep drain pipe, placed vertically instead of horizontally, and will attract water or moisture into itself from a distance of two, three or four times its depth ; indeed, wells have been known to receive contamination from a distance of nearly 1,000 feet, and if the well should be sunk down to or in an impervious, inclined stratum or slope of rock or clay, it may drain localities even further than this. We have only to consider the case of a hillside densely peopled to realize the inevitable pollution of wells and springs from leaking cesspools or drains situated further up the slope.

A report by Mr. Childs, health officer of Oxfordshire, England, contains a striking instance of the fouling of wells from a source above their level, which is reproduced here as forcibly illustrating the danger in question : "In consequence," the report says, "of the escape of the contents of a barrel of petroleum, which had been buried in an orchard, a circuit of wells sixty feet below and three hundred yards distant became so affected that the occupiers of fifteen houses, containing eighty-two inhabitants, were for ten days unable to use the water for drinking or cooking. The cattle of one of the proprietors, moreover, refused to drink *at the spring* where they had been accustomed to drink." Had this soakage been sewage, instead of petroleum, who can doubt that the result might have been wholesale water poisoning, and an outbreak of typhoid fever, dysentery or cholera ? It is a very moderate statement to say that nine out of ten cesspools, or privy vaults, the State over, do leak, and are constructed to leak, and thus save the expense, labor and nuisance of frequent cleaning.

CISTERN WATER.

Cisterns are liable to the same dangers with wells, and, in addition, usually have carried into them much fine dirt, or pulverized street filth, from roofs which form their water-shed. Even when made with an effective filter-chamber, they should be examined and cleaned every summer, or oftener if their water grows distasteful. Cisterns are also liable to be cracked or burst by pressure from within or without; and, being thus rendered leaky, are occasionally entered by polluted water. From just such a cause there occurred, in the autumn of 1874, an epidemic of typhoid fever in a boarding-school, in Birmingham, New Jersey, and the epidemic of yellow fever in Memphis, Tenn., in the summer of 1878, was undoubtedly augmented, if not occasioned by the same cause. It is interesting to note that the infecting agent in both cases was leakage into the subsoil from privy vaults near the cisterns, both of which were supposed to be strongly built and water-tight. It is all important that cisterns, when used for the storage of drinking water, should be built and maintained with intelligent care, and that their owners should not rest secure in the idea that because they no longer use well water they are in no danger of drinking fouled water. Whatever be the source of supply the price of safety is "eternal vigilance."

Dr. Welfley, in the article before referred to, gives the water analyses of five cisterns in Cumberland, which shows that the water in the best one of them was far from being a good or wholesome water. This was the cistern of a prominent physician, which had been constructed according to the most improved methods; but with all this care it contained too much albuminoid ammonia, and the water was properly classed as unwholesome." The other four were unequivocally "condemned." In speaking of the large amount of free and albuminoid ammonia and chlorine in No, 2, Dr. Welfley says: "On inspection after analysis, four large living frogs, three dead ones, a dead rat, and a deposit of about six inches of black, filthy mud at the bottom, were discovered in it." The amount of chlorine he found would seem to indicate leakage from a household cesspit.

In these receptacles, apart from the danger of sewage pollution, or the intermingling of the contents of the cesspit or cesspool with the water of wells or cisterns, the minute impurities, brought in with the supply, accumulate into a mass of growing foulness which undergoes constant decomposition, and being stirred up by the daily delivery, contaminates the entire contents of the cistern or well, and every pint of water which is drawn from it. This consideration, which may be confirmed by volumes of evidence, but is too palpable to require proof, leads to the desirability of dispensing with these separate household supplies of water, by providing a constant supply of pure water in the mains and service pipes of the city supply, so that any required quantity may be at all times instantly commanded.

THE SUPERIORITY OF A PUBLIC WATER SUPPLY.

The superiority of a public water supply over private wells and cisterns is not greater in the facility with which the water thus obtained for the current use of the persons supplied than it is in the economy of the supply. The first cost of cisterns and wells, with all the expense and inefficient paraphernalia of pumps, etc., is entirely obviated by keeping the mains, service and communication pipes always charged. It is well known that the due care and cleansing of cisterns and wells are greatly neglected, especially among the classes who are actively engaged in their business or daily labors, as well as by those who are unable to command the services of others for such purposes. These receptacles are often badly constructed and covered, leaky, open to the entrance of soot, dust and dirt of all kinds, frequently exposed to the action of the sun, and almost invariably neglected when repairs and cleaning become indispensable. If these separate and inefficient means are superseded by a constant supply of pure water from the public supply, delivered in the best possible condition, the economy will be manifest in many ways, but in none more obviously than an improved condition of the public health.

Impure water means sickness in a community, and sickness means expense, anxiety and discomfort. Dr. Brouardel, the distinguished hygienist of Paris, has asserted that fully 90 per cent. of all cases of typhoid fever arise from drinking or using for dietetic purposes unwholesome or polluted water. How shall we estimate the cost of sickness caused by bad water and impure air?

It is estimated that there have been in Cumberland during the last 18 months fully 600 cases of fever. Each of which has cost for nursing, medicine, food and other things incident to sickness at least $45	$27,000
These 600 persons must have had medical advice, and allowing for each person say $20	12,000
Of 600 persons sick we may say that one-third were bread-winners, earning, let us say, $2.00 per day; one-third of 600—200; average period of sickness 20 days	8,000
	$47,000

In this calculation only one disease has been taken into consideration, though there are other diseases, such as scarlet fever, diphtheria, dysentery, etc., that depend upon like causes. No estimate, moreover, has been made for the funeral expenses of those who died, which, if added, would probably swell the amount to $50,000, most of which would have been saved to the body politic, had proper sanitary measures been maintained.

Apart from the question of humanity, such an unnecessary and burthensome loss should tend to strengthen the hand of health officers in their endeavors to strangle and stamp out infectious disease; but unluckily there are always to be found in every community certain individuals who have no inclination to enlarge their views beyond that contracted sphere in which they are appointed to move, and who are, consequently, prone to treat all sanitary provisions with indifference, and look upon sanitary officers as officious intermeddlers, whose only function is to interfere with personal rights. Let not the people be deceived by this foolish talk about "personal liberty," which, in this connection, is just another name for *personal selfishness*. It is a false and vicious liberty, that permits one individual to destroy the health and life of another by maintaining a nuisance, even if it be on his own property. Such liberty means slavery to your neighbor.

You may claim that this is an affair of the moral sense, and not of the law, and that you are within your rights when you give the first consideration to your own interests. That may or may not be the case, as we view it from different stand-points ; but you are certainly not within your rights when you show indifference to the welfare of your neighbors. It should be remembered that one man's selfish interests may be another man's poison, and one man's liberty may be another man's death. No man is at liberty, under the laws of the State, to poison his neighbor, and so no man should be allowed to injure or give disease to his neighbor by practices which are in direct conflict alike with the sanitary laws of the State and the dictates of a common humanity.

Sanitary progress demands many things—a proper direction on the part of the State Board of Health, a policy of education rather than coercion, a gradual development as against hasty interference, intelligent co-operation on the part of the local authorities, a certain knowledge of sanitary cause and effect, a steady sense of public duty. In no part of life is the need of a broad conception of the interdependence of the various members of the body politic so pressing.

DRAINS AND SEWERS.

The removal of surface and subsoil water constitutes an important feature in the sanitation of all towns, and it may not, therefore, be out of place to explain, in a few words, the difference between a sewer and a drain, before treating of the one or the other in detail. A sewer is a pipe for removing impure water, or water that has been fouled ; a drain is intended to take the wetness out of the soil, or, in other words, to dry the soil : it is not for the purpose of carrying away impure water.

Now, as it is the function of sewers to carry away impure water, it is obvious that they should be impervious to water, otherwise they would, on certain occasions let their contents leak out into the subsoil of the town, underneath houses, and also into wells or springs, if there are any. But if the pipe is impervious, the soil or subsoil cannot enter it, and therefore it cannot act as a drain, except in so far as the subsoil water may follow the line of the sewer pipe on its outer side. In this way sewers are capable to a certain extent, of acting as drains also. Again, a sewer may be so constructed as to act both as a sewer and a drain. That end is attained by setting the bricks of the invert, as it is termed, in the cement, and setting the others, or those above the level of the usual flow of sewage, in mortar, in order that the soil water may pass into the sewer by imbibation or capillary attraction. These drain sewers, it may be remarked, are on the plan of the oldest sewers we know of, namely, the Cloica Maxima of Rome, which, however, was not constructed originally as a sewer, but for the purpose of draining off the water from the Forum, which it does to this day. It only came to be used as a sewer afterwards, that is to say, to have refuse matters thrown into it. The adverse criticisms which have been passed upon the Romans for not making the Cloica Maxima impervious would seem, therefore, unjust. "Main sewers and drains should be adapted," as Mr. Rowlison, the great English engineer, has said, "to the town area, length of streets, number of houses, surface area of house yards and roofs, number of street gullies, and volume of water supply."

NATURAL DRAINAGE.

The direction of the long axis of the elevations and depressions in Cumberland is generally South, 20 degrees West. Through the depressions flow a series of waterways, which form the natural drains of the city, and finally empty into the Potomac River, for the most part above the canal dam. Of these streams Wills' Creek, supplemented by an old mill race supplied with water by a dam across the creek above the Baltimore and Ohio Railroad viaduct, forms the most important part of the drainage system of the city. It drains the northern and central divisions of the city, and flows in a generally southern direction until it empties into the Potomac River above the canal dam.

At a point just south of the railroad viaduct above referred to "Dry Run" empties into Wills' Creek. This run drains a large section of country, extending probably nine or ten miles, with an average width of about one mile. Wills' Creek is also the natural drainage channel for all surface drainage from the eastern slope of the western section of the city.

What is known as "The Race" supplies the next most important drainage channel in the city, It runs parallel with the creek, and in its course receives the drainage of a large section of the eastern side of the city, and from Bedford Road, which covers an area of one square mile. It also receives, at the foot of Mechanic street, the drainage from a sewer built by the Baltimore and Ohio Railroad Company, which has an area of cross section of about nine square feet. The Race empties into the main basin of the canal, from which ice is taken during the winter, chiefly for manufacturing purposes. It was stated, however, that considerable quantities of this filthy ice had been used for dietetic purposes also.

During high water in the Potomac the river water enters the creek and "backs up," into the densely settled parts of the city, leaving behind it accumulations of mud and silt in the bed of the lower part of the creek, and a large deposit of organic matter upon its banks, which rapidly decomposes and becomes offensive as the water falls and exposes it to the action of sun and air. In addition to this source of pollution there are a large number of privies, built directly over the creek and race, or upon their banks, the contents of which are discharged directly into the waters, while the surface and sipe water, for a distance of several hundred feet in many localities is also contaminated with fæcal filth from surface privies, overflowing and leaky vaults, &c.

On the west side of the city "Sulphur Spring Run" is the principal drainage channel. It runs from Rose Hill Cemetery to the Potomac river into which it empties about 400 feet above the water-works. Up to July or August last the city water supply was pumped directly from the river below the mouth of Sulphur Spring Run, and consequently was contaminated with all the filth brought down by this run, including sipage from the graveyard. Now the water is taken from the river at a point about 900 feet above this run.

A SEWERAGE SYSTEM NEEDED.

There are practically no sewers in Cumberland. While the natural facilities for surface drainage are ample, they have not only not been fully utilized or preserved, but in many instances they have been materially impaired, and in some entirely destroyed by changes in the original conformation. With an extremely retentive soil, this obstruction renders unpaved streets and alleys almost impassable during wet weather, and really accounts for the large proportion of damp and wet cellars and basements. There are several private drain pipes (eight and six-inch terra cotta pipes) from dwellings to the creek from the west side, and to "The Race" from the east side. In times of low water these private sewers empty their foul contents on the banks of these streams, which become very offensive in warm weather. That some system of sewage disposal is absolutely necessary for the comfort and protection of the community goes without saying. It is an important subject and one which should be thoroughly considered. On several occasions I have discussed the question with Mr. Gaffney, the City Engineer, who certainly has a clear conception of what the city needs in this and other respects, and I take great pleasure in giving place to his views, as a valuable contribution to the sanitary literature of Cumberland. Mr. Gaffney says:

"You ask me to suggest some system of sewage disposal. This is a very important subject, and one which must be thoroughly studied. I can give you but a bare outline of what I consider absolutely necessary. On looking at the map of the city one would naturally suppose that Wills' Creek or the Race would be the natural main artery of the city sewage, but as Wills' Creek flows into the Potomac above the canal dam, across the latter, and the Race empties into the canal basin, both of these have their outlets too high and too near the centre of the city. They could not or should not, therefore, be availed of to carry off the city sewage. A large main sewer could be constructed parallel to these—down Centre street, probably, and continued down, parallel to the canal basin, through South Cumberland, to a point where it could be carried *under* the canal and into the river. This would give a fall of about thirty feet in two miles, and would empty the sewage into the river below the city and dam, where it will do no injury. Into this main sewer lateral sewers should be run, commencing at Dry Run, and, as might be found necessary, one down Hanover street, Bedford street, Frederick, Baltimore, Union, Harrison and Williams Road, etc. Connecting these sewers at their heads, sewers should be built along Independent, Columbia and Decatur streets. These sewers would intercept the drainage from the hills on the eastern side of the city.

"The sewage of the western half of the city would be more difficult to dispose of, as it is entirely above the Potomac dam. To dispose of it so that it would not pollute the waters of the Potomac and Wills' Creek, within the city limits, it should be carried *under* the river and deposited below the dam. An intercepting sewer down Green street to Water street, and one along Water street from Ladew's tannery, both emptying into the river at its confluence with Wills' Creek, would prevent any sewage emptying into the river above the water works, and into Wills'

Creek above the Baltimore street bridge across the creek. The water is seldom less than six or eight feet deep above the dam, and the sewage would not be exposed to the influence of the sun at low stages of water. This about covers all the ground for the present and near future of the city requirements. If the city grows to any much larger proportions, the expansion will be mostly southwards, where a drainage system will be very simple and inexpensive in comparison with what is necessary for the present city limits.

"There are at present 74 streets in the city, amounting to 21 miles in aggregate length, and 80 alleys, aggregating 6¾ miles. Of these streets there are 7½ miles paved, ½ of a mile with brick and 7 miles with cobble stones. We have a committee of the City Council on streets and alleys and a street superintendent, whose duty it is to have the streets and alleys cleaned. Most of the cleaning, however, is done on the principal streets of the city. The alleys are sadly neglected. The City Engineer has no authority in the matter, or in any other appertaining to city affairs. Like the City Attorney, he is supposed to give his opinion upon matters concerning his profession only when it is asked for. The railroad companies, so far as I have observed, keep their tracks and right of way clear of all refuse matter and dirt. I know that the railroad with which I am connected as chief engineer does, and always has done so, on principle, along the whole length of its lines."

The plan of Mr. Gaffney, which contemplates discharging all the sewage of Cumberland into the Potomac river below the dam, when considered only with reference to the City of Cumberland, is no doubt most excellent, but there are other circumstances to be considered. Nothing is more certain than that the discharge of crude sewage into a river in any considerable quantity is inadvisable. It is, in fact, a method of shifting a nuisance from the nuisance producer to his neighbor lower down the river. In any event the outfall would have to be below the contemplated work shops of the Baltimore and Ohio Railroad Company. The evils arising from such discharge depend mainly upon the suspended matter in the sewage. This, first of all, floats about near the outfall. Certain portions of the organic matter combining with aluminous compounds from alluvial mud, brought down by freshets, and in time deposition takes place, the various ingredients being deposited more or less in the order of their specific gravity.

The organic impurities of the sewage in this manner collect on the banks and in the bed of the river and ultimately putrefy, which is the case with the bed of the river above the dam at this time. The gases developed and bottled up in time render the solids sufficiently buoyant to rise to the surface, where the gases of putrefaction are given off, the solid matters again sinking to undergo fresh putrefactive changes. Thus the nuisance from the discharge of sewage into the river may be far more offensive at some distance from the outfall than at the outfall itself.

As regards the matters in solution, provided the sewage be sufficiently diluted and allowed a certain flow, complete purification will be effected by oxidation. This fact is now admitted by nearly all chemists, and need not detain us further. The self-purification of running water is, however, not to be regarded as an argument in support of allowing crude sewage to be discharged into a river, and the general government will, no doubt, be forced at an early period to enact a law to protect the water supply of Washington City against such an evil.

In 1875 a committee of the Local Government Board of England, appointed to make a special inquiry into the systems of sewage disposal then in operation, reported, in part, as follows :

"4. That most rivers and streams are polluted by a discharge into them of crude sewage, *which practice is highly objectionable*."

"5. That the treatment of sewage by deposition and chemical precipitation effects a considerable improvement, and when carried to its greatest perfection, may be accepted."

"7. That town sewage can best be disposed of and purified by the process of land irrigation for agricultural purposes, where local conditions are favorable to its application."

"8. That land irrigation is not practicable in all cases, and, therefore, other modes of dealing with sewage must be allowed."

This being the sewage with which the City of Cumberland has to deal, the object to be attained is twofold:

(1) To make use of any valuable constituents that it may contain ; and

(2) To purify it.
Sanitary requirements, however, demand that no nuisance should result in the course of the operation of treatment.

That it is necessary to get rid of refuse matters generally, and especially so of this particular kind of refuse matter, from the neighborhood of habitations is now regarded as axiomatic. I could quote from any number of authors showing that the general death-rate from certain specific diseases, especially typhoid fever and cholera, depends to a very great extent upon the amount of filth, and especially of excretal filth, that is in and about the habitations of people.

Take the following opinion from the evidence given by Mr. Kelsey before the Commission on the Health of Towns in England. When asked, "Does the state of filth and the effluvia caused by defective sewerage, by cesspools or privies, and decomposing refuse, powerfully affect the health of the population?" he answered, "Yes, it does; it always occasions a state of depression that renders persons more liable to be acted on by other poisons, even if it be not the actual cause of it. The line of habitations badly cleansed, and in the condition above referred to, *will almost certainly form the line of typhoid fever, diphtheria, scarlet fever and cholera:*"

Referring to the cost of constructing adequate sewers for towns and villages, the following from the *Sanitary News*, of March 14th, 1891, will serve to show that the expense involved is not so great as is generally supposed:

"Many small towns are prevented from introducing sewers and enjoying the more approved sanitary conditions thereby secured, by a false impression of the expense involved The old-time sewerage system which provided for storm water as well as sewage proper, required very large, costly sewer pipes. An objection to this system is the washing into the pipes of considerable quantities of sand and gravel, which form dams at frequent intervals, causing the sewage to accumulate in pools, and filling the pipes with offensive gases, which sooner or later find their way into the homes connected with the sewage system. The modern 'separate system' of sewerage provides two separate pipes, one for carrying away the storm water, the other for the sewage, and is much less expensive, as sewers must be made absolutely impervious, while for storm water ordinary drains will answer. In some towns, indeed, on a high or rolling situation, the storm water may be carried off by surface drainage. It is found that small pipes answer the purpose of sewage conduction much better than large pipes, as the stream more nearly fills the pipe, flows more freely, and thus keeps the pipe freer from sediment. An eight-inch sewer laid at a grade of even one foot in one hundred will, it is said, carry away much more sewage than will be discharged from a row of houses, each with forty feet front, two miles long, each house occupied by five persons, it being supposed that each person will furnish not less than 60 to 80 gallons per day of sewage or contaminated water. It has been estimated that in average soils an eight-inch sewer pipe can be laid at an expense, including cost of pipe, of less than two thousand dollars per mile, the expense to each forty feet of front being only about $10.60, and the interest at 4 per cent. forty two cents a year, or eight cents per head of occupants. With a sinking fund to pay off the principal in 20 or 40 years, so that the next generation, who would receive equal benefit, would aid in the payment, the yearly cost would be far less than is constantly being paid almost daily for some trifling, useless or injurious luxury."

CESSPITS AND CESSPOOLS.

The most usual plan of getting rid of excretal matters in Cumberland is to dig a hole in the ground and discharge all this refuse matter into it. When this is done, unless the hole in the ground is impervious, a great amount of the refuse matter will percolate into the earth around, and get into the wells or springs, and in some instances this has been actually encouraged, with the express, distinct and avowed object of letting the liquid matters, and as much as possible of the solid matters, percolate the soil and get away as best they can. These dumb wells, as they may be termed, have been made and shut up with the deliberate intention of not being opened for many years, and in certain places, the soil has been so absorbent that when opened the wells have been found empty. Now that plan need only be stated to be condemned, for wherever they exist the well water near them, which is extensively used, is largely polluted, and is in fact to a great extent supplied by these very dumb wells. In almost every town where there is an epidemic of typhoid fever this condition has been found to exist.

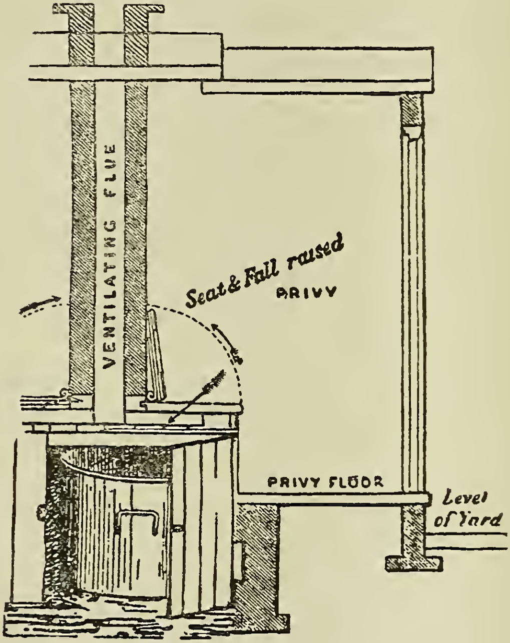
An improvement on this bad plan, or want of plan, would be to line the pits with cement, and provide a drain from them into the nearest sewer or water way. Another plan is to do as is done in Paris, where typhoid fever prevails at all times—make these large cesspools (so large that they take six months, or even a year, to fill) under the houses, or under the courts, impervious, and not drain them at all. Of course the pits are only theoretically impervious, practically very many of them certainly are not so. But, supposing they are, they in any case require a ventilating shaft, or the foul air which collects in them will find its way through, some way or other, and will poison the air of the house.

The disadvantage of the Paris plan, apart from the general disadvantage of having such a thing as an immense cesspool in the yard or underneath each house, is found in the emptying of them. This operation causes a fearful nuisance, although they may be emptied as in Baltimore, by means of a large tank on wheels, in which a partial vacuum is first created, so that when the hose is attached to the tank and placed into the pit, the semi-liquid stuff rises up and fills the tank. As a matter of fact, this system is expensive, as well as unhealthy.

SIMPLE METHODS OF SEWAGE DISPOSAL.

Some one of the so-called dry systems is probably the only plan that will suit the existing conditions in Cumberland. There is one known as the Manchester plan, another as the Rochdale plan, and still another known as the Hull plan, and lastly Moule's dry earth closet; but in all these the ashes are thrown into the pit or vessel in which the excreta are collected, so as to make a semi-solid mass. The conditions necessary for them are these: In the first place, they must receive no moisture from the soil around; in the second place, they must allow no liquid to escape from them, because, if so, they are confessedly failures.

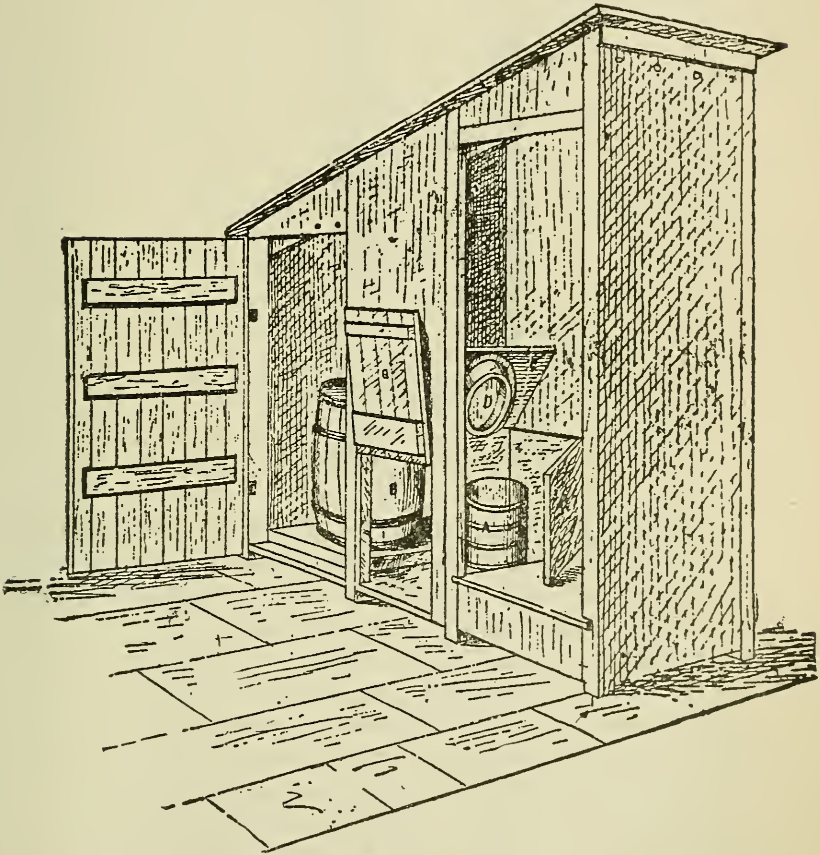
Fig. 1.



The Manchester Method, Fig. 1, consists of a common privy outside the house, constructed with a sunken pit, in which stands a galvanized iron receptacle, placed under the seat of the closet. The floor of the pit is of earthen ware, and the ventilation is through the flue, as shown in the illustration. The door for removing the receptacle is at the side or back. In the absence of the receptacle, the ashpit can be used. The receptacle is emptied weekly.

The Rochdale Method is similar to the Manchester, except that the wooden pail, generally made from a kerosene barrel, is substituted for iron, and sits immediately beneath the closet seat and on the same level of the floor, instead of below the surface of the ground, which makes removal more difficult. Fig. 2 is an illustration of the Rochdale system.

FIG. 2.



ROCHDALE PAIL CLOSET.

A—Excrement pail.

B—Ash tub.

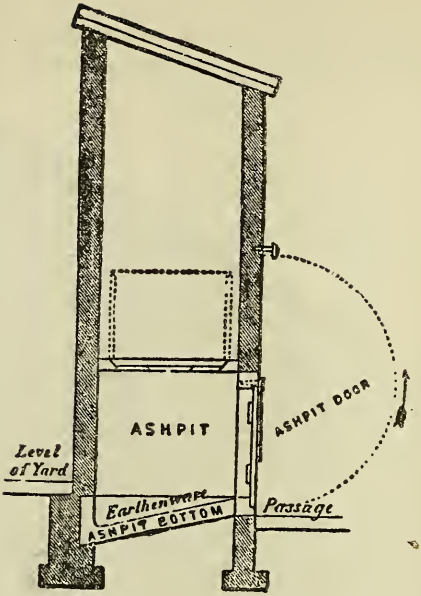
C—Seat cover (raised).

D—Iron collar below seat, reaching slightly into pail when cover is down.

F—Hinged upright of seat.

G—Door admitting from outside to excrement pail.

Fig. 3,



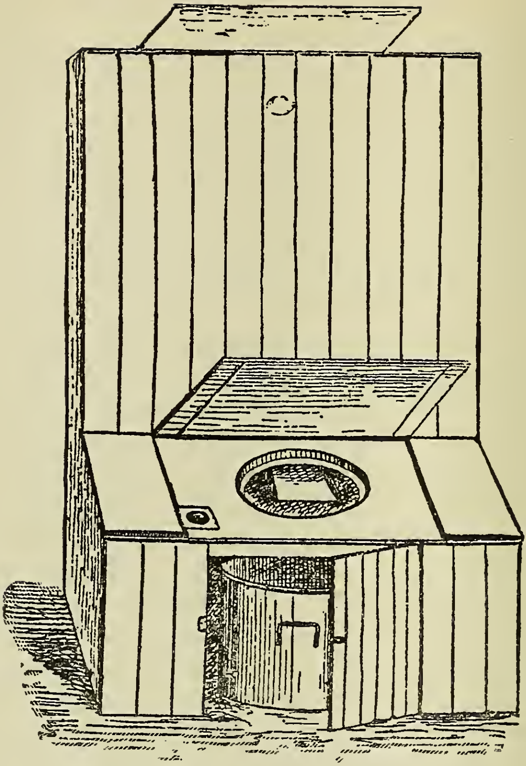
The general principle of the ashpit midden or Hull system is illustrated in Fig. 3. It consists of a common privy, with a small covered ashpit, from the top of which a ventilating shaft is taken to the roof of the house to which it is attached. The floor of the ashpit is of glazed earthenware, absolute water-tight. The ashes used as an absorbent are emptied into the pit through the privy seat, whenever the closet is used. These pits are cleaned as often as may be necessary.

With either of these systems it is desirable for sanitary reasons, though not for economical reasons, to have the receptacle as small as possible, in order that as little of these matters shall be retained about the premises as possible. The midden closet used at Hull consists of an impervious receptacle, which is not sunk in the ground, but is, in fact, merely the space directly under the seat of the closet, the front board being movable, so that the scavenger can get the stuff when full. That, no doubt, is the best of these simple closets.

After this we pass on to another arrangement, which is in fact a temporary cesspool—that is to say, a simple tub or box placed underneath the seat to collect the excretal matters, these tubs or boxes being collected every day by contractors and their contents used for manure. This is really the system out of which most is gotten in the way of profit. It has been practiced in China for thousands of years, and is now used in the neighborhood of Nice, in the South of France, where they grow orange trees and scented flowers, and other things which require rich manure. Above all, it is the system in which there is least waste. Of course, the difficulties of the system are enormous, and the nuisance is considerable; but there is no doubt whatever of the fact that, for small places, where water closets do not prevail, it is infinitely a more healthy and more reasonable system in every way than either of the other plans that we have thus far considered. In China, as also in Edinburgh and Glasgow, it is carried out with a simple bucket, in which the refuse matters cannot be allowed to remain for a long time, because the vessels are small and the matter would become offensive. This system is evidently better for health than keeping the matters about the premises for a long time in pits.

Lastly, we have among the dry systems of collection Moule's Dry Earth Closet, in which the deodorizing and absorbent power of earth is applied to the treatment of excreta. This closet is illustrated in Fig, 4.

Fig. 4.



The dry earth closet has been much praised, but it requires great care and attention to prevent its getting into a state of nuisance; it is ill-suited for general use in a town. In the first place, the earth used in it must be dried, and, in the second place, it must be deposited on the refuse matters *in detail*—that is to say, you must not take a great heap of excretal matter and throw a lot of dry earth on it, but you must throw a little earth upon each separate heap that is deposited.

It is found that about four pounds and a half of dry earth is requited to deodorize the excretal matters that are passed in twenty-four hours by an individual.

With this system it is a *sine qua non* that no liquids are to be thrown into the earth closet. If any liquids are accidentally thrown in, or if, as is the case in certain places and at certain times, the air is very damp, or if the contents of the closet get moist in any way you have, to all intents and purposes, a cesspool without its advantages, or without the special precautions that are commonly taken with regard to cesspools.

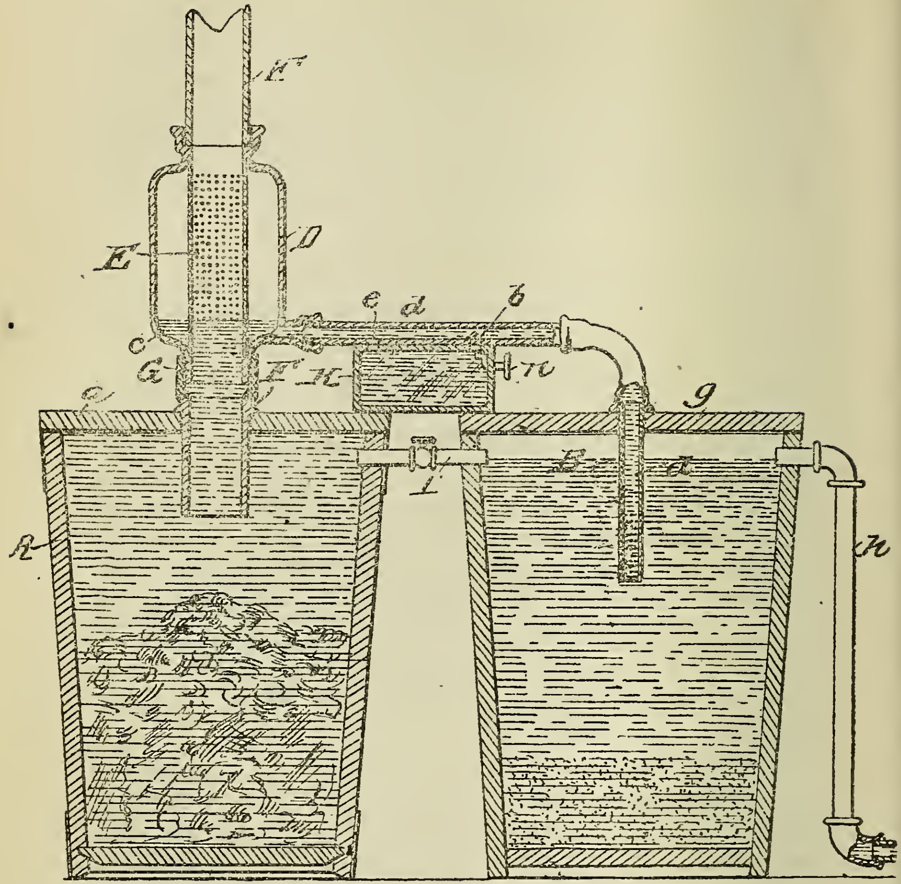
A NEW SYSTEM.

I may be permitted to say a few words about a system which I have recently introduced and which is coming into quite general use in houses provided with water-closets. This method consists simply in a process by which the solid matters are effectively separated from the liquids of excretal sewage by mechanical straining, subsidence and chemical precipitation, whereby the solid suspended matters are detained in hermetically closed receptacles, which when full can be readily removed and replaced with empty ones by a common laborer, while the effluents or liquid parts are continuously delivered in such a condition of purity that they may be sent into any drain, sewer, well, stream or water-way, without silting up the bed, or causing nuisance.

The apparatus is attached to the lower end of the soil pipe leading from the closet, and the separation of the solids from the liquids of crude sewage as it passes from the closet is effected: (1) by means of a well-devised screen or strainer; (2) by discharging the solid matters thus separated under a column or bed of water in a closed receptacle; (3) by precipitating the finer suspended matters in a second receptacle or precipitating tank; and (4) by discharging the overflow from the precipitating tank at any convenient place, or disposing of it by sub-surface irrigation.

The accompanying drawing, Fig. 5, representing a verticle section of the apparatus, illustrates the entire device:

FIG. 5.



A—Receiving vessel.
B—Precipitating tank.
D—Outer cylinder of strainer.
E—Inner perforated cylinder of strainer.
F. F—Soil pipe.
G—Collar connecting soil pipe with " receiver."
H—Box for precipitating reagents.
d—Pipe for strainer to precipitating tank.
h—Discharge pipe.

A, represents the receiving vessel or "receiver;" B, the settling vessel or "precipitating tank;" D, the outer cylinder of the "strainer;" E, the inner perforated cylinder of the "strainer;" FF, the soil pipe from the closet connected with the strainer above and below; G, the collar which connects the soil pipe with the receiver; H, the box or holder for the precipitating reagent: I, pipe connecting the receiver and precipitating tank for the purpose of drawing down the water to prevent slopping when the vessels are removed or changed. Through the meshes of the inner perforated cylinder E, which may be from $\frac{1}{16}$ to $\frac{1}{20}$ of an inch in diameter, the liquid sewage passes on its way to the precipitating tank, while the coarser solid matters are held back and sink into the "receiver." The bottom of the space between the outer and inner cylinders is a solid floor, C, which leads the strained liquid into the discharge pipe, D, which empties into the precipitating tank, on a level six or eight inches lower than the mouth of the exit pipe, H, through which the effluent from the precipitating tank is discharged.

This apparatus can not only be applied to the present water-closet system without any change whatever in the construction of the same, but admits of closet apparatus of a much more simple character than those now in use, and affords absolute protection against sewer gas. A receptacle of 400 pounds capacity—an ordinary whiskey barrel—will contain the solid excreta of ten persons using it daily for three or four months, so that the receptacle need only be changed or emptied once in that time.

STREET CLEANING AND GARBAGE.

There does not seem to be a well organized system for cleaning the streets and alleys of Cumberland, and some of the latter are mere repositories for filth of every kind. Theoretically, they are supposed to be cleaned by the city, but practically the so-called cleaning is more a term used than an operation performed. Certain it is, much complaint is made of neglect in this respect, even as to the paved ways, and no pretense is made of going into the unpaved streets and alleys; in fact, it would be hardly possible in wet weather to do so. No marked or radical improvement, therefore, is to be looked for in this direction until better highways are provided; but some relief might be secured (1) by taking advantage of favorable weather, during which the street force should be increased to the necessary capacity; and (2) by enacting and vigorously enforcing ordinances requiring the work to be pushed *pari pussa* with the capacity for prompt removal. Tenants, occupants, or owners of property, should be required to clean the gutters and sweep streets and alleys bordering on their premises, for a space of at least four feet from the curbstone, and to pile up the cleanings in the centre of the street or alley for the garbage carts—this to be done twice a week, the days for each ward or street to be designated by the Board of Health.

The city engineer, or superintendent of streets, should be empowered to have such work done for delinquents and non-residents at their proper cost; and all railways should be required to clean the roadway between and for two feet on each side of their tracks. Street crossings and intersections should be kept clean, and all street sweepings and garbage removed by the city. This would require at least four open carts of 32 cubic feet capacity for ashes and street sweepings, and two or three water-tight carts of the same capacity for wet and other garbage. At present there is no provision for the removal of either wet or dry garbage, and it is disposed of in every conceivable way—thrown on vacant lots, in alleys in the rear of premises, in yards, in disused cisterns and wells, in abandoned privy vaults, and gullies, into and on the banks of the several streams that flow through the city.

CELLARS AND BASEMENTS,

An important defect noticeable in some of the dwellings is the want of subventilation, the houses being built so close to the ground as to have no air-space beneath the floor, while others have insufficient or obstructed subventilation. In many of the buildings, especially in the principal business part of the city, the cellars are badly ventilated, damp and wet, with water standing from two inches to two feet deep on the floors, and with walls soaked by sipage from the surrounding polluted soil. As these cellars are seldom over 6 or 8 feet deep, any general system of sewerage and subsoil drainage would tend to remedy the defect.

Among other subterranean defects, quite a number of cellars were found to be fouled by accumulations of decomposing organic matter, and other materials. All wet cellars should be efficiently drained or emptied, disinfected and filled up; and all dirty cellars should be cleansed and whitewashed.

CONDEMNATION OF BUILDINGS.

In the detailed reports made by the several inspectors a number of structures have been recommended for destruction, or at least for such alterations and repairs as may be necessary to fit them for occupancy. These include some business houses, as well as worthless shanties and overcrowded rookeries, which rent for two or three dollars a month to the most squalid, filthy and degraded whites and blacks. These wretched dwellings, together with the poverty, ignorance and sometimes crime, of those who occupy them, are incidents in the general condition of this class of the population in every city.

In dealing with this question much reluctance if not positive opposition may be anticipated from the owners of these houses, but the authorities should proceed on the assumption that such houses as are unfit for habitation are public nuisances, and the community in such cases should compel the owner to put them in proper condition, or require them to be closed or demolished. It is certain that much more can be done than has yet been undertaken to require owners to keep their property in better sanitary condition, by the due enforcement of proper regulations; but for this purpose the local authorities must be strengthened by the hearty support of public opinion. It is the city and not the property owner that requires public sympathy. There is not the slightest danger that any injustice will be done the latter. When property is affected injuriously, the outcry which the owner makes is generally sufficient to correct the evil. Personal interests usually manage to take good care of themselves; it is the *public good* which is so often powerless and voiceless in the presence of the audacity of private wrong. A municipal government charged with the protection of the natural rights of the people has little chance against the eager, persistent and vociferous clamor of the "vested rights" of individuals with which it has to contend, and the experience of town authorities in enforcing the most moderate precautions for the preservation of health and the safety of life has not been encouraging.

The wretched condition to which the poorer classes are sometimes reduced, and the hovels which they are sometimes forced to occupy, often have an influence on diseases that will more than counter-balance the boasted salubrity of any community. The law should make it an offence punishable by heavy fine to own or rent property for habitation which is unfit for the purpose. It is very well worth the while of the people of Cumberland to face this question and to solve it. To punish neglect or indifference to sanitary provisions is a question simply between the rights of property and the rights of the community, and until this fact is faced no reform will be possible.

UNSANITARY SCHOOL HOUSES.

Among the imperfections of construction found in some of the public schools of Cumberland, in several instances, the outside "offices" were found to be abominably filthy and shocking to every sense of decency. Every school, whether public or private, should be under sanitary supervision, and the sanitary authorities should have the power of prohibiting any building or room being used for school purposes where the sanitary conditions are not in all respects satisfactory. For a more detailed account of the sanitary conditions of the schools of Cumberland, reference is invited to the report of Prof. Wm. P. Tonry, who was specially designated to make an inspection of these places.

VACCINATION NEGLECTED.

In spite of the incalculable benefits conferred by vaccination, and the statute which makes it "compulsory" in this State, it was found, as already stated in my preliminary report, that more than fifty per cent. of the children attending schools—public and private—were unvaccinated. This leads me to say a few words as to the protective power of vaccination, and when it should be performed.

The beneficial results of vaccination are now so plainly evident that, it has been said, "it would be more rational to deny the daily rotation of the earth upon its axis, or to doubt the truth of the laws of gravitation, than to question the salutary effects of vaccination." In the German army where vaccination of the soldiers is required to be regularly performed, at intervals of a few years, epidemics of small-pox are unknown. The trial of revaccination in that army has conclusively demonstrated the efficacy of the measure as a means of getting rid of small-pox altogether. One-fourth of the total mortality from small-pox in this country occurs in children under five years of age, who have not been vaccinated; and hence, the great risk of delay. Healthy children living in large towns should be vaccinated when about four months old—in more delicate children it may be postponed a month or two longer; but all, except those whose health positively contraindicates it, should be vaccinated before the age of six months.

It may be stated generally that persons who have been successfully vaccinated are, as a rule, protected. It is, however, a very proper precaution that every one should be revaccinated every ten or twelve years, and oftener if small-pox prevails. In a great many it does not "take" as it is called, and this merely indicates that the susceptibility to the disease has not returned; or that the virus used is defective. In a considerable proportion a second vaccination will take as perfectly, or nearly as perfectly as in an infant. Were vaccination and revaccination properly attended to, we should hear no more of small-pox, which be it said is now prevailing, in a sporadic form, in some of the Middle and Western States. To exclude the disease from our State would be, certainly, a very desirable consummation, and altogether possible; but I fear it will not be arrived at, practically, if other communities in the State are as derelict, in this respect, as Cumberland has been. Prejudice and indifference are formidable enemies to overcome, but the good sense of the people of Cumberland will no doubt triumph in the end, to the extent at least of confining the disease, should it occur, within the narrowest possible limits.

We can never expect to get rid of sickness altogether, for susceptibility to diseases is a law of our nature, and where we have to deal with the phenomena of life, vitality introduces a disturbing element, which we can never expect to get the better of; but we may safely look forward to a period when we shall be able to undertake a more equal struggle with disease,—a period when the success of the sanitarian shall be more nearly than at present on a level with his good intentions.

The following table shows the number of deaths from small-pox in each million of inhabitants in some of the European Countries in which vaccination is optional, and in an equal number where it is compulsory, from which it will be seen that in the former the pestilence still prevails, while in the latter it is almost wholly extinct :

		1887.	1888.
Austria—Hungaria,	Vaccination Optional,	583.7	540.4
Russia,		535.9	231.5
France,		167.0	191.9
German Empire,	Vaccination Compulsory,	1.8	0.8
Denmark,		0.0	0.0
Sweden and Norway,		0.0	0.0

There is no preventive against small-pox so certain as vaccination, and if this fact could only be fully impressed upon the minds of the people, and they could be led to appreciate its truth, the day would not be far distant when we should have as little fear from an invasion of the disease as the people of Germany, Denmark and Sweden, where "Compulsory law" means *compulsion*, absolute and irresistible.

MORTALITY FROM ALL CAUSES.

An analysis of the mortality records of Cumberland, for the years 1889, 1890 and 1891, furnishes the following table.*

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* The data given is from *The Courier*, a weekly paper published in Cumberland. C. E. Hambright, Publisher and Manager.

DEATHS IN 1889.

Months.	Children under five years.	Adults.		White.	Colored.	City Total.	Vicinity.
		Male.	Female				
Jan..	14	4	1	18	1	19	16
Feb..	16	2	5	19	4	23	16
Mar..	18	4	8	21	6	30	16
April	15	7	7	26	3	29	19
May.	8	8	8	20	4	24	15
June	12	5	5	21	1	22	10
July.	15	8	1	15	9	24	13
Aug.	7	5	8	18	2	20	18
Sept.	12	6	7	21	4	25	5
Oct..	9	7	1	14	3	17	7
Nov.	6	5	6	15	2	17	12
Dec..	9	4	4	13	4	17	7
Total	141	65	61	224	43	267	154

From Paper published Jan. 11, 1890.

DEATHS IN 1890.

Months.	Children under ten years.	Adults.		White.	Colored.	City Total.	Vicinity.
		Male.	Female				
Jan .	8	10	17	30	5	25	10
Feb..	13	15	10	38	.	29	9
Mar.	27	26	22	71	5	51	25
April	14	12	14	37	3	22	18
May.	16	13	14	41	2	26	17
June	9	9	11	26	3	19	10
July.	15	8	8	29	2	17	14
Aug.	14	7	18	34	1	22	13
Sept.	9	2	17	16	2	8	10
Oct..	8	5	8	21	.	11	10
Nov.	12	13	9	34	.	18	16
Dec..	10	5	6	18	3	15	6
Total	155	125	154	395	26	263	158

Making a total of 421 deaths for the year; 259 of which were reported from January to July, and 162 from July to January. *The death rate for March was nearly double that of any other month.—From paper published Jan.* 3. 1891.

DEATHS IN JANUARY AND FEBRUARY, 1891.

Months.	Children under ten years.	Adults.		White.	Colored.	City Total.	Vicinity.
		Male.	Female				
Jan. 3	6	4	2	11	1	7	5
“ 10	3	.	2	4	1	3	2
“ 17	4	3	3	8	2	4	6
“ 24	1	1	2	3	1	2	2
“ 31	2	4	7	13	.	10	3
Feb. 7	3	4	4	11	.	8	3
“ 14	5	1	4	9	1	7	3
“ 21	6	5	2	13	.	8	5
“ 28	.	4	1	5	.	1	4
Total for 2 mos.	....	..	..	..	..	..	..

TRACING THE DISEASE.

The pathological identity of the Cumberland fever, which I have termed "Entero-Miasmatic Fever," with true enteric or typhoid fever, has not, in the absence of post-mortem examinations, which could not be obtained, been clearly established. A large proportion of the cases have been mild; diarrhoea and rash have been absent in many cases, as well as grave bowel symptoms; frequently along with fairly typical cases, there have been in the same family, successively, cases departing widely from type, and often characterized by well marked periods of remission, so much so that one of the leading physicians thinks it may be properly termed a type of Remittent Bilious Fever, while others have stoutly maintained its identity with typhoid fever. Many of the cases are certainly anomalous, but the bacteriological examinations, as will be seen by the report of Dr. Miller, have revealed the specific typhoid germ, *in the excreta* of a patient in whom many of the objective and subjective characteristics of genuine typhoid fever were already recognized. The diversity in the non-essential phenomena may be explained by individual peculiarities of age, constitution, etc., but in the presence of the specific germ it is not difficult to fix the identity of the disease with that of true enteric fever.

The existence of a pathogenic micro-organism in drinking water as a condition precedent of typhoid fever, though strongly upheld by some physicians, especially on the Continent, is considered by English observers as not yet proved. Sir W. Moore, in a discussion on the subject in the Epidemological Society of London, January, 1891, held that the specific germ was a pure assumption, and that enteric (typhoid) fever was multiform, indefinite, and due to a variety of causes. The question as stated by the *London Lancet*, October, 1890, is, "Whether the property of infection is an adventitious one depending upon the soil in which the organism grows, or inherent in its substance?"

In commenting upon the experiments of Rodet and Roux, heretofore referred to, the *London Lancet* remarks: "Certainly none more practical could engage the attention of bacteriologists. If confirmed, the term *pathogenic fever*, introduced many years ago by Murchison, may yet be generally accepted as the proper one for the disease which is now somewhat vaguely styled typhoid or enteric fever."

The disease is undoubtedly a typical filth disease, and without reference to the question, whether it may originate in, or be caused by, the products of putrid animal matter, its prevalence unquestionably bears a constant relation to the condition of sanitary surroundings. Where there is a polluted water supply; where there is undrained ground, contaminated with excremental filth; where foul, overflowing or leaky privy vaults soak the earth for yards around with their contents; where defective, unventilated sewers and "skin" plumbing abound, there will this fever find a congenial *habitat*, and its most numerous victims. In such localities the infection, or *materies morbi*, will originate and spread, and finding its way by various unsuspected channels, may invade the most cleanly and carefully ordered household.

The most frequent mode of propagation is undoubtedly the water supply. A small quantity of the infective matter is sufficient to poison the contents of a well or cistern, or even a river, and thus to give rise to an out-break among the susceptible who depend upon such source of supply. This infective matter or poison, whether it be a modified bacillus *coli*, or a specific germ exists principally in the discharges from the bowels of those suffering with the disease; and so well has the deadly character of such discharges been established, that in Europe attempts have been made to secure legislation enforcing by statute provisions the compulsory disinfection of the intestinal evacuations of all patients suffering with typhoid fever or cholera. This of course would be impracticable in this country; but upon the "Family Physician" should rest the responsibility of seeing that thorough disinfection is carried out in every case of cholera or typhoid fever he may be called to attend.

A remarkable clear example of the relation of drinking water to typhoid fever occurred in 1885, at Plymouth, a small city in Luzerne County, P

I quote from the comprehensive report of the committee sent by the Mayor of Philadelphia to investigate the subject as follows:

"The mountain stream is a small one, running down over a rocky bed, and on a declivity not eighty feet from its bed a dwelling is situated, wherein, during January, February and March, was located a case of typhoid fever that is only now convalescent, the worst period of the case being about the 30th of March. The attending nurse was in the habit, during each night, of carrying the excreta from the patient and depositing it on the ground towards the stream. The ground, during all this time, was frozen and covered with snow, until the thaw and rain already alluded to occurred. The poison ouscharacter of the dejecta is not destroyed by freezing, but is only kept in a state of hibernation. A great part of the three months' accumulation of dejecta was suddenly swept into the rapidly-running stream, and reached the lower reservoir as quickly as a man walking fast would have arrived there.

"In fifteen days from this time the epidemic began, fifty cases occurring daily between the 10th and 20th of April. Up to the present twelve hundred people have been sick, and one hundred have died, out of a population of eight thousand. For the first three weeks the few people in the town who used well-water exclusively escaped the disease. The period of incubation varies from ten to twenty days, or longer, and therefore no other conclusion can be arrived at than that the infective poison existed in the mountain stream water, and originated from the one case of fever in the house on the side of the stream."

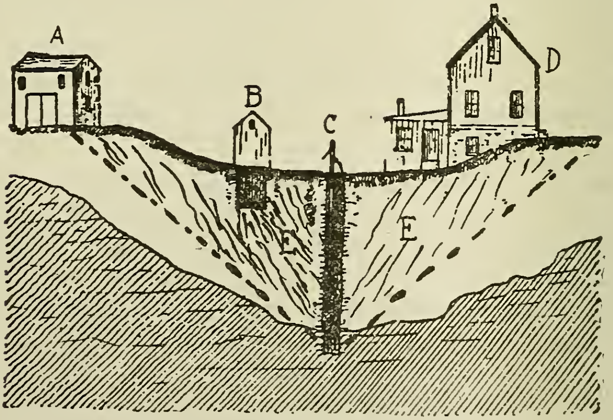
Dr. Brouardel, the celebrated hygienist of Paris, who has paid great attention to the water question, in a report made on the epidemic of typhoid fever at Pierefonds, has demonstrated that the bacilli of this disease will live during many months in the earth, and are carried by rains into water supplies a considerable distance from the place where the dejections are thrown or deposited.

Seeing then that the fæcal discharges of persons suffering from certain diseases are full of the microbes of those diseases, or at least certain bacilli which are capable of degenerating into disease germs under favorable circumstances, it is easy to comprehend how the percolation of such material into any source of drinking water may be fraught with disastrous consequences. It is indispensable to the health of communities, therefore, that the utmost care be taken to preserve the purity of water supplies, and to guard them with increasing care against every source of contamination.

The water of shallow or dug wells is always to be suspected, especially as the water in such wells is generally badly ærated, and is likely to contain extraneous and unhealthy matters. River water, which is excellent if it has not been subject to contaminating influences, depends for its purity, so far as suspended matter, such as muddy particles is concerned, upon the nature of the surrounding soil and the velocity of the stream, but impurities of this kind are easily separated by means of filtration.

It is manifest that where the disposal of excrementitious matters are not made with proper care, and where the water supply for domestic purposes is drawn from superficial wells, the depth of which seldom reaches more than twenty or thirty feet and rarely exceeds fifty feet, there is great danger of contamination, since the filtering bed through which the refuse liquids percolate and are carried in their course by meteoric waters are insufficient to transform or disinfect all the poisonous organic matters which they contain.

Fig. 6.



The diagram, Fig. 6, illustrates how a well may be contaminated from surface drainage and soakage. Five cases of typhoid fever occurred in the family living in the house, and seven more among other persons using water from the same well.

This condition, important in a sanitary point of view is characterized by the presence in the water of nitrites, ammonia, chlorine, potash and organic matters notably in excess of those found in water drawn from unpolluted wells, or wells situated remotely from any source of pollution. It is quite well known to all who have paid attention to such matters, that water may be entirely limpid and tasteless and yet contain the same organic matters which are found in the most offensive liquid sewage.

It appears, moreover, from the evidence of scientific research, as well as from reasoning by analogy, that water may be contaminated by being mixed not only with the organic matter of sewage, but also by passing over or coming in contact with the polluted soil of graveyards, decomposing matters of cesspools and privies, or by the organic matter derived from the decay of any animal or vegetable organisms. But the most dangerous sources of contaminated water are undoubtedly the wells, springs, streams or rivers from which water is used for household purposes, and into which more or less excretal sewage has passed. Numerous cases in proof of this could be cited, but it is only necessary to give the following. which is indicative of general results in similar cases:

Mr. Burns relates that in a certain town of Scotland there was a severe outbreak of dysentery and typhoid fever. A physician, called to attend some of the cases, set to work to find out the cause. On inquiry as to the water supply, he was directed to a spring on low ground in the midst of the settlement, so situated as to receive the drainage from a cesspool. The water was pure and sparkling to the sight and taste, and was loudly praised by those who used it. A quantity put in a bottle and allowed to stand a few hours threw down a thick sediment of most offensive matter, which, on being tested, was found to be as purely excrementitious as if it had been taken from a privy. The people ceased to use this water, and the epidemic disappeared at once.

In a village of New York typhoid fever broke out and prevailed with great violence in a certain locality. Search was made for the cause by the attending physician, but in vain. An appeal was made to the health authorities, and an expert officer examined the history of the outbreak and predicted that a certain hydrant which supplied the victims with drinking water communicated at some point with house drains or the street sewer. The water-pipe was examined, and at a distance from the hydrant a house drain was found leaking into it at a point where they traversed each other. The repair of these pipes was the cure of the epidemic.

In a farmhouse in Massachusetts, situated in an interior township famous for healthfulness and the beauty of its scenery, typhoid fever broke out in a violent form. Of eight members, five perished and one was seriously ill. The house was situated on an elevation, and all its surroundings were admirably arranged for health. One could readily believe the statement that "there had not been a case of sickness in the house for twelve years." The following is a history of the sickness : *

> "A few weeks before the disease appeared the pump in the well broke, and the farmer being pressed with work, neglected to have it repaired. Meantime the servants brought water from a spring at the foot of the hill, which soon became low, owing to a drought. Resort was then had to a small brook, and from this source the family were supplied with water for two weeks. This stream, higher up, ran through several farm yards, and received the surface drainage. The first symptoms of poison by this water were slight nausea and a mild diarrhœa. After several days typhoid fever in its worst form was ushered in. Of the entire family but two escaped an attack, and they did not use the water. An examination of this water revealed a sediment of excretal matters."

At Pittsfield, Massachusetts, typhoid fever suddenly broke out in a large boarding school for young ladies.

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* Massachusetts State Board of Health Report.

The water was found to be contaminated with sewage, owing to leakage from the cesspool. A similar occurrence took place some years ago at Princeton College, New Jersey.

At Edgewood, on Staten Island. Professor Chandler relates that the inmates of a small block of houses were affected with typhoid fever, several deaths occurring. On making investigation, it was found that a neighbor through whose land the underground drain passed had taken the liberty of closing up the drain, thus sending its contents back upon this block of houses, contaminating the wells and murdering the unfortunate victims with sewage poison.

The process of filtration through the soil, which water derived from subterranean sources undergoes, tends to separate the organic impurities, animal and vegetable, but this process is often palpably insufficient to secure the requisite purity. The topographical and geological character of the site of the town, and of soil and sub-strata, are also to be taken into consideration.

Professor Chandler has declared, in a paper on "The Sanitary Chemistry of Water," published in the reports of the American Public Health Association, that "many diseases of the most fatal character are now traced to the use of water poisoned with the soakage from soils charged with sewage and excremental matters."

Dr. Macadam, a distinguished chemist of Edinburgh, Scotland, who has paid great attention to the water question, states that "the line must be distinctly drawn between non-putrescent organic matter and that which is putrescent. Impregnations from sewage form the most dreaded contamination. and yield waters which, though clear and sparkling, and cooling and refreshing, are yet most unwholesome and deadly."

It is obvious that infection of the soil by decaying organic matters will not only vitiate the subterranean waters, but also the air of dwellings to the extent of impairing health. Independently of the infected volatile products which are evolved in the process of putrefaction, infective germs are sometimes concealed in the excretions, especially the dejections from cholera and typhoid patients.

The accumulation of the refuse matters of every-day life in the neighborhood of human habitations becomes more dangerous in proportion to the quantity accumulated, since the chances of infiltration, with its train of evil consequences, such as vitiated air, polluted soil and contaminated water, are greatly multiplied.

There is a prevailing impression that the germs of typhoid fever are not communicated through the air we breathe, but are transmitted only by the absorption of the water we drink or the food we eat. A great number of observations, however, have shown this opinion to be erroneous, and it is now known that the disease can be communicated through the medium of infected air.

After studying the various ways by which typhoid fever may be propagated, Professor Bouchard, of the Faculty of Paris, says:

> "The transmission of typhoid fever by polluted air rests upon evidence the most positive. Gielt relates that a man who had contracted the disease at Ulme returned to his home, a village in which the malady had not existed for many years, and the disease soon developed itself in the town. The dejections of the sick man were thrown on a manure heap; in a short time thereafter four persons were attainted with the disease, and a fifth had intestinal catarrh with tumefaction of the spleen. The dejections of these new cases were buried under another manure heap, which was opened after nine months. Two men were employed at this work, and one of the two contracted typhoid fever and died." *

According to Greisinger, the development of typhoid fever depends upon the action of putrid exhalations, particularly such as come from filthy privy pits and from excretal matters undergoing putrefactive fermen-

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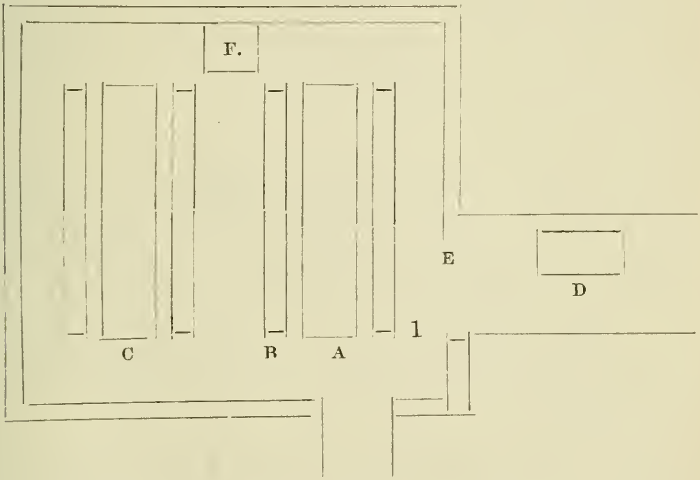
*Report of the International Medical Congress of Geneva, September 1877.

tation in cesspools and sewers. These emanations he regards as "the active elements which play the essential role in epidemics of typhoid fever."*

Laver has communicated the following details of a serious endemic of typhoid fever which occurred in a boys' school attached to a charity institution :

> "Of thirty-five pupils, twenty-eight contracted the malady. The first cases, and at the same time the most serious, occurred among the pupils who occupied the benches *a* and *b*, on the diagram, Fig. 7; and the very first case was that of the pupil who sat in the seat indicated by the number 1. The cases observed among the pupils who sat at the desk *c* were relatively mild."

FIG. 7.



> "All the pupils slept in similar apartments, ate the same food, and, in all respects, were treated alike."

M. Laver was convinced that the fever was caused by emanations proceeding from an open inlet to the sewer, situated in the passage-way marked D. He says:

> "It will be noticed that the pupils seated on the benches marked *a* and *b*, who were the most seriously affected, were directly in the current of air which came from the sewer-inlet D, through the doorway E, and passed on

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* *Traite des Maladies Infectienses*, page 256.

to the fire F, which at that time was kept burning all day. Subsequently the opening into the sewer was closed, and the fever did not recur. There was no possibility of its having been introduced from without, and no case had existed previously in the institution. The pupils first attacked had been inmates of the house more than twelve months, and had not left the premises a single day during the time. The establishment was situated a little outside the town, but the sewer communicated with the houses of two or three rich families, in each of which there had been several cases of typhoid fever."

Murchison *Treatise on Typhoid Fever*, 1878, page 73) relates the following circumstance:

"During the autumn of 1858 an epidemic of typhoid fever declared itself at Windsor, which was made the subject of special study by a medical commission. Four hundred and forty persons were attacked, and thirty-nine died. The opinion of all who were engaged in the investigation was that the fever was due to emanations from the sewers, which passed directly into the houses."

In M. Leon Colin's *Study of Typhoid Fever* (Paris, 1878, pp. 109 to 120), he recounts a number of epidemics of typhoid fever, the origin of which the army physicians ascribed to miasmatic emanations from latrines and cesspools located in the barracks or garrison. Many other illustrations might be cited wherein the outbreak of the disease has been traced directly to the poisoned air proceeding from sewers and excretal cesspools.

We should hesitate to pronounce as dangerous kitchen slops and other household waste waters, when recently formed and free from putrescent matters or infectious germs; but Emerich has demonstrated that while such refuse liquids, when fresh, cause no injurious effects if injected into the circulation of animals, they will occasion disastrous effects if injected after they have remained several days and become decomposed. It not infrequently happens, moreover, that these foul waters contain infectious germs, and the necessity of exercising great care with reference to them is not only important but urgent.

Another danger, less apparent but not less formidable, which arises from pollution of the soil by organic matters, is the vitiation of what is known as "ground air." This air, which occupies the interstices of the soil to a depth of several feet, is, especially in the winter, when the rooms are warmed, drawn into the apartments and forms part of the ventilation of the rooms, particularly those on the ground floor, which generally contain 10 or 15 per cent of ground air. One can, therefore, readily understand and appreciate the importance, nay, the necessity of preserving the soil near dwelling houses in a pure and uncontaminated condition, for, as is the soil near a dwelling, so will be the air within.

CONCLUSIONS AS TO THE CAUSES OF INFECTION.

In an inquiry into a disease such as that prevailing at Cumberland, where the cases are distributed very generally over the town, there are four sources which are ordinarily looked to as those whence the infection is most likely to have proceeded, and by the medium of which it may have been distributed, viz.: 1. A common source of water supply, such as some particular well or stream, or the mains of a system of public supply, in which case infection of the water, either at its source or in its progress, may result in the distribution with it of an infective material. 2. A common system of drainage, in which case a sewer becoming infected may be the means of distributing, through the means of the sewer air, infective air to the house or houses in relation with such sewer. 3. Where there is no common water supply and no common system of drainage to account for a wide distribution of fever, the cause of the spread may be found in the progressive infection of independent privies, &c., and by soakage from them into independent wells or other supplies of drinking water; or (4) the cause of the spread may be found in the distribution over the district of some particular article of food, such as milk, which has become infected.

With a view to the full understanding of the present very difficult case, it will be well to consider the ordinary sources of infection severally.

I. There is no common system of drainage, and no cases of the disease having been traced to any particular milk supply, those sources of infection may at once be eliminated from consideration.

II. The water supply of two-thirds of the houses invaded is derived from the city or river supply, and that of the remaining third from wells close to the houses, most of which are sunk into and gather their water from the water-bearing stratum under-lying the town; and the water on this layer, which supplies all the wells, being undoubtedly infected, as has been shown by oft repeated chemical analyses, could have caused the spread of the disease. I am not prepared to deny, indeed, there is strong reason to believe that in some instances this has actually happened; but we can by no means assign it as the main cause of the disease. With respect to the river water, it is a fact which has attracted attention, that a large proportion of the houses invaded, as above stated, derive their supply from this source alone, which is the common supply of the town: and this seems to have been the case in connection with each of the two apparently distinct outbreaks of the fever, namely, that apparently ending in July, 1890, and that apparently commencing in January, 1891. It is proper, therefore, to inquire whether an influence of this kind has been operative, and if found to have been operative, secondly, to what extent other circumstances operated in conjunction with it. That the river water, *per se.* was not the sole cause of the spread of the fever is proved by the fact that, even assuming all the houses invaded to have drawn water from this source (which was not the case), comparatively few of the whole number were attacked; while among those that were invaded there was something else in common and differentiating those houses from others that took water from the same source. To attribute the spread of the fever wholly to this cause would, under the peculiar circumstances of the case, be about as reasonable as to attribute it to the general atmosphere which the population breathed in common, and which no doubt bore its part as a factor in the spread of the disease, as will appear from the third feature of the infection.

III. Throughout the entire area of the town there are sanitary defects which might have had a part in spreading the fever, and most probably were to some degree operative in this way; these various sanitary defects have reference mainly to the mode of disposal of excrement and slops, and the relation of the mode of disposal of these matters to the atmosphere and wells of the city. Some of the larger residences in the city have water-closets which discharge into brick-walled cesspools, sometimes cemented, but in most cases laid with open joints or spaces. In the former case the contents of the cesspool are occasionally cleaned out and carried away; in other instances they overflow upon the surface and soak into the ground. In the latter case a direct soakage into the ground is constantly going on. The middle class and most business houses are provided with ordinary cesspit privies, usually so constructed as to permit of soakage of the contents into the ground. House slops are either at once thrown upon the ground, or being carried away by drains to a distance ultimately soak into the ground in like manner. In several instances the drains leading from the water-closets of good residences discharged directly on the surface of the ground, and in other instances are so badly constructed as to be leaky. Having regard to the fact that the ground intervening between cesspools, cesspits and leaky drains, and the wells and cisterns is always more or less permeable, the great liability of wells and cisterns to become polluted, by soakage of foul matter into the ground, must at once be obvious. In every instance where chemical analysis was made of the water of wells and springs in the town, the foulness of the water was such as to render its use for drinking or dietetic purposes absolutely dangerous. In only two instances was the water in cisterns found to be pure when subjected to chemical and bacteriological examinations. I refer here to the cistern in the court-house yard, and that at the residence of the Hon. Lloyd Lowndes. There is also a well at the Queen City Hotel, dignified by the name of an "artesian well," which is fairly free from organic matter, but far too heavily loaded with mineral matters in solution to be considered a good potable water.

While it is believed that the atmosphere and the wells of the city, polluted by foul emanations and soakage from filthy privies, have contributed no inconsiderable share towards the spread of the disease, there are against this explanation the following considerations:

(*a*) That the condition of things described as respects privies and well-water has existed for many years prior to 1890; and although by importations or otherwise cases of fever had now and then occurred in the town, the disease had never before assumed an epidemic form, but cholera has on two occasions, in 1833 and 1854, invaded the community epidemically.*

(*b*) That in many instances the houses invaded (following the chronological order of their invasion) are situated at a long distance from one another, in some instances as much as half a mile; and only in a few instances had there been any communication between the inmates of invaded houses, and especially of such a kind as would lead to any probability of persons attacked with the disease having infected the atmosphere or the privies of any house subsequently invaded.

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* This was long previous to the introduction of the river water supply.

(*c*) That on the other hand, where there was intercommunication between the occupants of houses, one of which had been invaded, and where, therefore, it was possible that the privies, and, secondarily, the atmosphere and well-water of one house might have been infected by the occupant of another house, fever did not spread from one house to another.

(*d*) Lastly, apart from any question of infection of privies or water from some previous case, it is not a fact that the houses in any particular district, the arrangements of which in respect of the disposal of the excrement or sewage, or in respect of water pollution were faulty, were those solely or even principally invaded. A number of cases occurred in houses, the sanitary arrangements of which, although not always unexceptionable, were far superior to those of houses occupied by a large part of the population who yet escaped the fever.

DETERIORATION OF THE RIVER WATER.

I would not labor unduly to frighten the citizens of Cumberland out of the use of that "poisonous fluid" called water; but *prima facie*, there appears a strong probability that the prevalence of the fever has been in some way, and to some degree, associated with the the city water supply as cause and effect. And this *prima facie* evidence turns out to be strengthened by the chemical and biological examinations made of the water, as will be seen by reference to the reports of Professors Tonry and Miller, respectively, wherein it is conclusively shown that, while the water at the intake from the river is not as pure as it could be desired, it is nevertheless much purer than that distributed in the mains, showing that the water in its progress from the intake at the river is in some way polluted with an infective material, which, it is believed, exists either in the receiving cistern at the pump-house or in the well immediately under the pumps, neither of which, it is stated, has been cleaned in a good many years—probably not since the inauguration of the system in 1873—and both of which have been subjected to pollution from various causes, increasing *pari passu* with the amount of water used, and which will continue to augment and become more virulent until proper measures of correction are applied. Again it is obvious, from the great waste of water, that the mains and service pipes are in a very defective and leaky condition, and it is possible, indeed *highly probable*, that they imbibe infective matter from the polluted soil in which they are imbedded.

But it is not alone to an accumulation of putrefactive matters in the receiving cistern and pump well, extending over nearly twenty years, that we must look for deterioration of the water supply. There is another source of dangerous pollution. It has been ascertained that there exists a continuous and free sipage of highly-polluted water from the dam into the receiving cistern, which was intended as a clear-water cistern, and also into the pump well. It is quite manfest, therefore, that the pumps, taking water from these receptacles and delivering it to houses in the city, are necessarily delivering a very impure if not absolutely dangerous water. The fact that water taken from the dam at this point is dangerously polluted was recognized by the city authorities more than a year ago, when an effort to correct the evil was made by removing the intake pipe several hundred yards higher up the river, above the sources of contamination; but it is now obvious that this very proper provision has corrected the evil only in degree, not in its entirety, for the inflow of contaminated water to the pumps still goes on to a very considerable extent, and the greater the volume of water in the dam the greater the inflow. Moreover, the stratum of earth through which this sipage takes place, and which formerly acted as a filtering medium, has no doubt become filled with an abundant sediment of organic filth, which is imparted, in the form of low organisms, to every gallon of water that passes through it, and which is an offset to any advantage that may have been derived from the removal of the intake pipe.

The amount of water flowing daily into the clear-water cistern and pump well, by sipage from a polluted source, is probably more than one-third of the entire amount which is daily supplied to the city ; in other words, the supply going into the pumps is derived to a considerable extent from sipage water, which is known to be dangerously polluted. This is a matter that should claim special consideration on the part of the city authorities, for it is entirely practicable to overcome the evil by thoroughly cleaning and cementing the cistern and well, so as to exclude absolutely all sipage water. The water brought down through the intake pipe, though not at all times clear, is otherwise a good water, and as the quality of a water is the first consideration for health, the community should not be satisfied until the changes necessary to secure it have been effected.

If the city authorities, or those at least who have charge of the water service department, would look "at home" and see what time, and dirt, and neglect have been piling up in the receiving cistern, pump well and dead ends of mains for nearly twenty years, as well as the infiltration of polluted matter into the water through defective joints and broken pipes, the water of the Potomac would not so easily lose its reputation, nor the people their health. Peep into these sources of contamination, for here lies the worst part of the evil ; here is the fault—here is the neglect—and here must a great portion at least of the remedy be supplied. Professor Tonry shows by his analysis that there is from 14 to 17 per cent. more of objectionable organic matter in the water that leaves the pumps than in that which enters the inlet pipe, and his tell-tale chemistry has been fully confirmed by the bacteriological examinations of Professor Miller, who has reported 4,504 more bacteria in a cubic centimeter of water drawn from the spigot at the pump well than in the water drawn from the river at the inlet. These investigations have clearly demonstrated the following facts :

1. That the river water taken at the inlet pipe is reasonably pure.

2. That it is contaminated with infective matter in its progress for distribution.

3. That the most obvious sources of contamination exist in the receiving cistern, and notably so in the well from which the water is pumped into the city mains; and no doubt by sipage into the defective mains and service pipes.

These receptacles, viz., the receiving cistern and well at the pump house, serve to deposit the mud and *floating* organic matters which the water must bring into them, and these matters become in time animalized, if such a term may be coined, and produce sickness among those who use the water. The inlet pipe may send the water as pure as possible, but it cannot remain so after mingling with the inflow of sipage water and passing through the two filthy receptacles above named, both of which must necessarily be highly polluted and obnoxious and dangerous matters.

I know not whether the city authorities can remedy the evils above pointed out, but it is clear, for their reputation as well as the health of the community, that they should, if they can, because there is no doubt that these evils will, from time to time, continue to make themselves felt, in a depreciated condition of the public health. The whole method of water supply, especially the condition of affairs at the pump house, is bad—essentially bad, or badly devised. Here comes the muddy water from the river directly into the pumping house, where it mingles with polluted sipage water, and gathers up such putrefactive matters as exist in the cistern and well, and is then sent into the street-mains to supply customers, instead of being pumped into a high service reservoir, where it could undergo subsidence and be afterwards filtered and delivered by gravity, in a reasonably pure condition to customers.

Although the Potomac water above Cumberland may not be as pure as that which comes from the clouds on St. Swithin's day, it is as pure as water taken from the river at any other place, and quite pure enough for domestic use, if properly protected and clarified. As far as can be ascertained, it contains, *per se*, nothing absolutely injurious, only a variable quantity of loam and clay in suspension, which can be readily eliminated by the simple process of subsidence and filtration.

At times it does not contain even that, and is purer than rain water after falling through the atmosphere of a large city. Of course reference is here made to water taken from the river above the dam, and far enough up to escape the possible contingency of pollution from the inflow of the city drainage. This is an important question to be considered. No man in his senses would assuredly lay a water-pipe at the mouth of a sewer, or near enough to be affected thereby; but when laid at any point that common sense would choose, the river-water will be good, even if it does receive some refuse from the houses on the banks, provided always that the pollution is not in the nature of specific germs, which, according to Koch and Flugge, will not only live, but multiply in the purest water. Dr. Bolton has shown (*Nouvelle Revue d'Hygiene*) that the bacilli of typhoid fever will live in pure water for thirty days, and three months in water containing one grain of organic matter per quart of water.

But in the water, as in the atmosphere, there is a regulation of nature (we can not call it a law) for decompounding and precipitating animal and vegetable substances. It is not easy to discover chemically, or truly what the exact process or processes are by which this change is effected; but some of the general causes are apparent. Let us note the common apparent causes; and first of these is bulk. The great disproportion of the pure water to the foul is the most obvious cause of purification. We mignt expect that this would only act by mere dilution, but it appears to do more, though it is not apparent how it does act chemically, further than through the dissolved oxygen contained in the water; the next apparent cause is motion, respecting the powers of which there is no doubt, and on the probable action of which it is more easy to speculate. If a pool of fresh, or salt water be at rest, and containing offensive matter, vegetable or animal, in solution, agitating it will in a great measure dissipate or precipitate the organic matter. And if quantity and motion be united, the effect is most rapid, as may be observed at sea after a prolonged calm. Now both quantity and motion are constantly operating on the water of the Potomac River, and thus it is purified every hour, every minute.

Again, the action of the atmosphere is largely concerned in the purification of water, by the exposure in succession of all parts of the water to the air. The volatile matter and gases become dissipated in the air, or decomposed by it as in other and commoner cases; but there is yet somewhat more accomplished, for some portion of the dissolved substances are thus rendered insoluble and are precipitated.

There is, moreover, another purifying cause, which singularly enough is one of the great grievances complained of. This is the mud of the river itself. I use the vulgar and prejudiced term "mud," because it will probably be better understood. Speaking chemically, I mean finely divided silica and alumina chiefly. This is a precipitant to the matters in solution, it combines with them, especially with the extractive matter and bacteria which corrupt and injure water, and carries them to the bottom, where their decomposition is afterwards completed, though not always very quickly, and we may, therefore, have pure water lying upon or flowing over offensive mud. Thus the mud or clay of the Potomac, which renders it so disagreeable to the eye, is after all one of the causes of purification and purity. Muddy water is not nice, but it is at least innocent, and it is seldom very difficult to purify. The people of Cumberland may, therefore, console themselves with reflecting that the visible evil of mud in the water produces a balance of good, and is a trouble that can and should be remedied by filtration.

RECOMMENDATIONS.

FIRST. That measures be at once taken to provide an efficient board of health. This will involve, among other things, the employment of a trained and thoroughly competent sanitary officer. There is a large amount of sanitary work to be done in Cumberland, the details of which must be left, to a great extent, discretionary in order to secure the best results without burthensome expense ; but this discretionary power should be intrusted only to a competent health authority, independent of politics, and unless it be provided, I do not think that any efforts to improve the sanitary condition of the city will be successful.

SECOND. That it is important there should be some change in the present system of water supply (1) by discontinuing absolutely the use of water from pumps or wells, and also from polluted cisterns and springs ; and (2) by filtering the present water supply from the Potomac River, through some preparation of iron before it is distributed throughout the city ; (3) by repairing, cementing, and keeping clean the receiving cistern, and pump well, and by making all mains and service pipes so absolutely tight no pollution can enter them from the soil in which they are imbedded.

Experiments have been made which appear to show that noxious microbes may be removed or at least rendered harmless, by certain methods of filtration. At the International Hygienic Congress which assembled in Paris in August, 1889, it was stated that guinea pigs were inoculated with water containing the microbe of anthrax, and that those inoculated with the water prior to filtration died with the usual symptoms of the disease, while those inoculated with the same water after filtration survived. It was also stated that "a sufficiently careful filtration will remove most organic matters—*among others strychnia;*" and the scientist who made this discovery was so sure of his facts that he drank, after filtration, a quantity of water in which, before it was poured into the filter, a poisonous dose of strychnia had been poured. Be this as it may, there can be no doubt that the filtration of water through magnetic spongy carbon, which is a form of burnt iron, will remove, according to Dr. Angell, 94 per cent. of the oxidizable organic matters in the water, and it is further stated by the same authority that the material is "quite impermeable to atmospheric germs."

THIRD. That impure ice is as dangerous as impure water, and ice for domestic use should never be gathered from a source where the water before freezing was unfit for drinking purposes. The germs of typhoid fever, and probably of other diseases, may be imprisoned in ice, and after liberation, by melting, become active in the production of disease. These are facts well known in sanitary science, and they should be equally well understood by the people.

FOURTH. That all cesspools and privy vaults in the city should be thoroughly cleaned and disinfected, and hereafter no system of dealing with excrement should be permitted which involves pollution of soil, water or air. That in those portions of the city so thickly settled as to warrant it, there should be introduced a system of sewers upon a plan substantially as recommended by Mr. Gaffney, but to discharge the crude sewage into settling tanks instead of the river, to be treated with chemical precipitants, and subsequently to run off the supernatant liquids on to an irrigation field and treat the solids *secumdem artem.*

Fifth. That garbage should be kept separate from all inorganic matter, such as ashes, &c., and regularly removed by city carts to the country for use by farmers.

It is all important that this highly putrescible matter should be systematically removed from the city before fermentation takes place. Many cities in America, both large and small, are now trying the experiment of cremating the garbage, and the experiment has thus far been attended with very satisfactory results. Whatever system may be adopted for the removal of garbage, or excretal matters, it should be under municipal control. The city should take charge of the removal of both excrement and garbage from all premises, and should insure by frequent and trustworthy inspection the cleanliness of all premises and the proper condition of the receptacles used for garbage.

Sixth. That the natural drains or streams passing through the city, with a sufficient strip of ground on each side to insure their control and freedom from pollution, should be made the property of the city for securing drainage and as public walks, the banks being properly grassed and a constant stream of clear water being secured in each one.

Seventh. That certain houses in the city should be condemned, torn down, the materials removed, and the premises thoroughly cleaned and disinfected. This will include not only foul shanties and cabins, but some larger buildings in the heart of the city.

Eighth. That a system of building regulations should be enacted and enforced. providing that no building shall be hereafter erected in the city unless the plans have been approved by the City Board of Health, and that the construction shall also be subject to its inspection and approval. All uncondemned buildings whose lower floors are less than two feet from the ground should be raised to that height as early as possible; and in future all dwellings should be built with their lower floors at least two feet from the ground; also, that all cellars and basements should be freely ventilated. All this should be enforced by municipal authority.

NINTH. That the draft of the code of health laws submitted to the Council through Mayor McKaig, be substantially adopted for the sanitary government of the city. This code it may be here remarked prescribes how slaughter-houses, and other industrial nuisances, shall be dealt with, and practically excludes pig-pens from the city limits.

TENTH. That all streets and alleys be properly graded and paved, or macadamized, on a properly prepared road-bed, with gutters and curbs made of cement or concrete.

ELEVENTH. That the health ordinances of the City be enforced *by the City Authorities*. It is quite impossible for the State Board of Health to exercise the functions of a municipal government, though it is at all times ready and willing to *aid* the local authorities in securing sanitary reforms.

TWELFTH. That politics be eliminated from the sanitary government of the City; and that all good citizens, without regard to party affiliations, unite in promoting the public welfare by insisting upon the enforcement of such measures of reform as will secure exemption from dirt, disorder and disease. *The health of the people should be the supreme law of the City.*

INSPECTORS' RETURNS.

The returns made by the Inspectors concerning the sanitary investigation of Cumberland show that 1603 house-to-house visitations were made—that 916 nuisances were reported, and that direct and positive data were obtained on 587 cases of typhoid fever which occurred within the corporate limits of Cumberland within the 18 months ending March 17th, 1891. Other cases of fever were mentioned to the Inspectors, but the removal of the families in which the cases occurred, and the unwillingness, in very many cases, of present occupants to know or remember what had occurred prevented the Inspectors from securing positive data as to such cases. This unwillingness to give information will be apparent by referring to the total deaths from typhoid reported by the Inspectors, viz., 52.

Deaths may occur in Cumberland from small-pox, typhoid fever, poison, or abortion, and the body may be quietly disposed of without the authorities having any cognizance of the case, and for the reason that no burial permit is required. The city keeps no record of deaths, and the death-rate in Cumberland at any time is an unknown quantity, the nearest approach to it that can be made being through the colums of the *Weekly Courier*, which paper collects its data from the undertakers.

Tabular statements of nuisances and of diseases reported by the State Board of Health Inspectors are given below:

NUISANCES REPORTED.

Privy vaults	in a state of nuisance	476
Wet cellars	" " "	85
Water closets	" " "	9
Privy in house	" " "	1
Open cesspool	" " "	1
Covered cesspools	" " "	26
Manure piles	" " "	41
Pig pens	" " "	139
Cow stables	" " "	8
Horse stables	" " "	4
Slaughter houses	" " "	5
Hide houses	" " "	4
Old wells used as receptacles of garbage		2
Sunken hogsheads used as receptacles of garbage		1
Piles of mixed garbage and ashes		2
Covered wells used as pig pens		1
Stables used as pig pens		1
Privies " " " "		2
Yards in a state of nuisance		47
Alleys " " "		9
Parts of streets in a state of nuisance		3
Open lots " " "		4
Drains " " "		30
Dilapidated houses in a state of nuisance		9
Overcrowded " " " "		2
Unused cistern " " "		1
Drain from privy, through yard, to run in front of house		1
Dead hogs in Race		2
		916

There were 158 cows found on premises visited. There were 468 pigs found on premises visited.

The number of pigs noticed on the streets, lanes, alleys and lots were not counted, as there were no marks by which they could be identified. Probably the total number in the city would not fall short of one thousand.

DISEASES REPORTED.

DISEASE.	RECOVERIES.	DEATHS.	TOTAL.
Typhoid Fever	535	52	587
Scarlet Fever	40	6	46
Diphtheria	13	5	18
Malaria	26	..	26
Consumption	...	3	3
Dysentery	5	..	5
Diarrhœa	3	..	3
Cholera Infantum	2	..	2
Chicken Pox	4	..	4
Capillary Bronchitis	...	1	1
Pneumonia	4	3	7
Erysipelas	1	1	2
Pleurisy	2	..	2
	635	71	706

Respectfully submitted,

C. W. CHANCELLOR, M. D.,

Secretary and Executive Officer.

State Board of Health of Maryland.

REPORT OF PROF. WILLIAM P. TONRY ON THE WATER SUPPLY OF CUMBERLAND.

BALTIMORE, April 3, 1891.

Dr. C. W. Chancellor,
Secretary State Board of Health.

DEAR SIR: The following report on the present condition of the water supply of Cumberland, Md., in connection with the sanitary investigation now under your charge, is respectfully submitted:

The water furnished by the municipality of Cumberland is known locally as the "Holly Water," on account of its being forced through the city by the Holly pumps and directly into the water mains. The water used is from the north branch of the Potomac River, taken within the city limits, and presumably from a point on the river bank about 1300 feet above the pumping house, which is also on the river bank and within 50 feet of the river. By natural flow, the water passes from the river into a brick well, a few feet from the river, thence by natural flow along the river's bank, through terra cotta pipe, for about 1300 feet, and then flows into a settling well, which is 20 feet deep and 28 feet in diameter. This well is just outside of the pump house and quite close to the river's bank. From the settling well the water flows into the well under the Holly pumps, and is then pumped directly into the street mains. The pressure on the street mains depends on the pressure maintained at the pump house, and should the pump stop the city water supply would stop. With the exception of the deposition, in the two wells mentioned, of the heavier particles of suspended solids that may be in the water, there is no attempt at purifying the water as it is received from the river, nor is it possible to clean out the two wells mentioned without stopping the entire water supply that is furnished by the Holly system.

On March 13, 1891, I obtained for analysis four samples of the city (Holly) water. Sample I, from the

Potomac River at the entrance to the receiving well; Sample II, from the receiving well; Sample III, from the settling well; Sample IV, from the pump-house spigot, just after the water had passed through the pumps. When these samples were obtained it was raining hard, and had been raining or snowing on the previous 6th, 9th and 12th days of the same month. The water in the river was high, and was flowing over the dam below the pump house. Sample V was obtained four days later, on the 17th of March, from the store of E. H. Welsh, 150 Baltimore street, a distance of about 2500 feet from the pump house. All the samples gave a solid deposit on settling, and this solid and suspended matter is not included in the report of analysis, as each sample was allowed to settle for at least five hours before the beginning of the analysis. In the analysis, the ammonia, free and albuminoid, is expressed in "parts per million," the other constituents in "grains per gallon."

	Ammonia.		Solids.				
	Free.	Album.	Volatile.	Mineral.	Total	Chlorine.	Character of the Sample.
I.	.03	07	4.00	4.20	8.20	.30	Suspicious.
II.	.07	.03	....	.....	.....	.30	....
III.	.05	.10	4.25	5 90	10.15	.50	Bad.
IV.	.02	.06	3.50	4.25	7.75	.35	Suspicious.
V.	.01	.08	4 10	4.20	8.30	.35	Suspicious.

Each of the above samples gives, by direct evaporation, a residue which blackened on burning, and the residue from III also deflagrated. Each one of the samples, without being evaporated or concentrated, gave with Nessler's solution a precipitate. Sample III immediate, the other samples after a short time. These precipitates accompany this report. The amount of organic matter (volatile solids) dissolved in each of the samples is about double what may be expected in a good water, and is in such quantity and of such quality, as shown by the albuminoid ammonia, as will suffice for the support and propagation of germ life and bacteria. Sample II shows the change, by putrefactive fermentation, of the albuminoid ammonia into free ammonia. Sample III, from the settling well, just outside the pump house, shows infiltration from some source, more impure than the water of the Potomac at the point from which Sample I was taken; the solids, volatile and mineral are increased, the albuminoid ammonia is increased, and the chlorine is increased, and nitrates are present. It may be that this infiltration takes place along the line of the terra cotta pipes, but whether it does or does not, the infiltrating liquid has an intimate connection with privy well, stable yard or some such source in which chlorine and nitrates may be looked for.

Comparing the analysis of Sample III with Sample IV, it will be seen that all the water delivered by the pumps to the city mains does not come from the settling well alone, as it is received through the terra cotta pipe. That this so-called settling well is not impervious to drainage from the immediate surroundings would seem certain from the fact that on one occasion, when the supply from the terra cotta pipe had to be shut off, the infiltration into the well could not be kept down by the use of one of the Holly pumps in the pump house. Comparing the analysis of Sample V with Sample IV would seem to indicate that matter deposited in the street mains causes the water when it reaches the consumer at a distance from the pump house to be more impure than the river water at the point where it is supposed to enter for the city supply.

In addition to the river water, Cumberland has two other sources from which water is obtained for drinking purposes, viz:—from cisterns in which rain water is collected and from wells sunk in the ground. It may be stated as a truth, verified in every locality where investigation has been made, that well water, drawn from the sub-strata of water, under a thickly populated locality, is unfit for use as a drinking water, I have found this true in Baltimore City in over 200 localities from which I examined the well water. I found this true in Frederick City in every well examined in the City during the prevalence of diphtheria there I have found it true in every thickly populated section where I have examined the subsoil water. As to the source from which well water is obtained, and as to the impurities that find their way into well water, I quote here part of an article written by me for the Baltimore Sun and printed in that paper on November 2d, 1888.

"That there is a subterranean sheet of water at different depths in different localities, would seem to need no other confirmation than the fact that water may be had in almost any locality simply by digging for it. The depth of this saturated subsoil or ground water will vary from a few feet to several hundred, depending very much on the position which the less porous rock or clay holds to the more porous soil above them. More than one stratum of ground water may and have been found in the same locality, but at different depths. The stratum of ground water is in constant movement towards the nearest water course, or towards the sea at the rate of five to fifteen feet per day, depending much on the character of ground which it traverses. It is from this ground water that our wells and springs receive their supply, while the ground water itself is furnished by the rain that percolates into the soil. It has been computed that about twenty-five per cent. of the rain that falls on sand rock will penetrate the rock, and about forty per cent. will percolate through chalk, while as much as ninety per cent. of a rain will find its way by percolation into a loose, sandy soil. With the solvent power which water is known to possess, and which it does not loose when percolating through the soil, it can readily be inferred that waste products committed to the soil without other thought or care than to get rid of them are dissolved by the water in its passage through the soil, and find their way to the nearest bed of ground water, and may make their presence felt in the water drawn from every well that draws its supply from that particular water belt. It is generally said that a well will drain a surface the radius of which is equal to the depth of the well, and the statement is true as far as it goes, but it by no means states the whole truth. A little calculation of the amount of water drawn annually from a well in constant use, and another calculation of the annual rainfall around the mouth of the well in a circle whose radius shall be the depth of the well, will show that enough rain does not fall in the space indicated to supply the amount of water taken, or that can be taken from the well. It would be more correct to say that a well drains or draws its water supply from the whole surface which furnishes the water supply to the belt of ground water with which the well is connected. It may be said *a priori* that the water of all shallow wells, in the thickly inhabited portions of all cities, is impure."

Indeed in a locality like Cumberland, where so much of the surface of the city is unpaved, where excretal matter finds its way into the soil, and remains until the soil is saturated, every rain, as it percolates through the soil, but adds to the defilement of the subsoil water strata, from which sunken wells receive their water supply.

The 70 foot well in the German Grave-Yard with 0.40 grains chloride per gallon, is the best well water in Cumberland—but it is not a pure water. The Rolling Mill well water with 0,90 grains chlorine, is more objectionable, and more suspicious. The water from the well in front of St. Peter and Paul's Catholic Church, with 2.40 grains chlorine, is worse than the Rolling Mill well, and is a dangerous water for drinking purposes. The spring in the rear of 13 Kearney Street with 2.70 grains chlorine, is unfit for use as a drinking water, as also is the water from the well back of St. Patrick's Catholic Church, with 2.80 grains chlorine. The water from a recently bored artesian well 50 feet deep, at 65 William Street with 4.50 grains chlorine is unfit for use as a potable water—while the water of the 22 feet well at 17 Baker Street, with 7.50 grains chlorine per gallon would be pronounced filthy by chemical analysis alone, even if there had not been 9 cases of typhoid fever in the adjoining house—and even if the attending physician had not found it necessary to order the use of this water to be discontinued. The amount of organic filth in these samples of well water is made apparent to the eye, in the sample bottles which accompany this report. *

In an absolutely pure natural water I have never found the chlorine to exceed 0.25 grains per gallon, while I have found it as low as 0.15 of a grain. Water from stable, barn, kitchen sink or privy will be found rich in chlorine. Man and indeed all animals must have common salt, and chlorine one of the constituents of common salt, unless in very homeopathic doses in a water, points like a danger signal to the very objectionable organic impurities with which it is always found.

A third source from which, in Cumberland, water is obtained for drinking purposes, is from rain water, which, after having been collected on the roof of the house, is stored in cisterns under ground. A sample of this kind of water, from the residence of Hon. Lloyd Lowndes, showed only 0.20 grains chlorine—one from cistern in Court House yard showed 0.25 grains chlorine—as also did a sample from the cistern in Monastery of Capuchin Fathers on Fayette Street. Further chemical analysis of these samples gave such

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* These waters are so absolutely impure that a more detailed statement of analytical results is deemed unnecessary.

results as would cause them to be classed as good potable waters, while the sample from the cemented cistern at 28 Washington Street, with 0.50 grains chlorine. would have to be classed, at least, as suspicious. This last cistern is 10 feet deep, and is said to be cemented within and without; but it is only about 15 or 20 feet from a deep privy well, and, notwithstanding the cement, the analysis points directly to the privy well as the source of contamination. In populous locations, where the soil is saturated with decomposing and decomposable matter, it should be remembered that the gases resulting from decomposition, and accompanying germs, find their way into the atmosphere, where they may remain until brought to the earth again by falling rain. When, therefore, cistern water is used, it should not be forgotten that rain water from a polluted atmosphere will itself be polluted, and that unless purified by filtration through burnt or spongy iron, or by other means, it may be a dangerous vehicle for the propagation of disease. Although there are, at present, some cisterns in Cumberland that contain good water, yet an increase of soil pollution, or an increase of manufacturing establishments from which impurities may find their way into the atmosphere will make it dangerous to continue the use of rain water, however carefully it may be stored, for drinking purposes.

Analyses of samples of water taken by myself from Blue Spring, from Paine Spring, from Gramlich Spring, and from the Spring at the end of Haley's Alley, show that the waters of these springs are too impure to be recommended as potable waters.

In 297 locations, within the corporate limits of Cumberland, wherein occurred about 440 cases of typhoid fever about which the State Board of Health Inspectors obtained direct and positive information,* there were 40 locations wherein occurred 62 cases, of which 7 were fatal, where the city water was not on the premises. There were 30 locations with 42 cases, 6 of which were fatal, where city water, as also spring, cistern or well water were on the premises. There were 227 locations with 336 cases, of which 28 were fatal, where the city water alone was on the premises. The following table gives these data more in detail:

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*A number of cases are known to have occurred of which no data could be obtained.

WATER USED.	No. of Locations.	No. of Cases.	No. of Deaths.	WATER USED.	No. of Locations.	No. of Cases.	No. of Deaths.
Well	16	33	3	City and Well	11	18	3
Pump	8	9	2	" " Pump	1	1	....
Cistern	6	6	3	" " Cistern	7	10	1
Spring	2	3	...	" " Spring	10	12	2
Rain water from barrel	1	1	....	City, Well and Cistern	1	1	....
Artesian Well	1	1	....				
Cistern and Artesian Well	1	1	...		30	42	6
Cistern and Pump	1	1	....				
Cistern and Spring	1	1	...	City Water alone	227	336	28
Well and Spring	1	4	....				
Well and B. and O.	1	1	1				
B. and O.	1	1	....				
	40	62	7		257	378	34

Respectfully,

WM. P. TONRY, Ph. D.,

Analyst State Board of Health.

VACCINATION IN THE SCHOOLS OF CUMBERLAND REPORTED BY PROF. W. P. TONRY.

DR. C. W. CHANCELLOR,

Secretary State Board of Health.

DEAR SIR—As directed by you, I visited, on the 4th, 5th and 6th of March, 1891, the public and private schools of Cumberland, Md., for the purpose of ascertaining how far the law of this State had been complied with, which requires each pupil to be vaccinated before being admitted to any school. The accompanying tabular statement, gives in detail, for each school and each class, the result of my investigation.

As a resume, I find in the

Public Schools, 1295 pupils on roll, of whom there were present

446 boys, of whom	222	were not vaccinated.....	49.7 per cent.
421 girls, "	192	" "	45.6 per cent.
867 "	414	" "	47.7 per cent.

Denominational School, 652 on roll of whom there were present

211 boys, of whom	134	were not vaccinated.....	63.5 per cent.
202 girls, "	111	" "	54.9 per cent.
413 "	245	" "	59.3 per cent.

Total on Roll, 1947, of whom 1280 were present, and of these 659 were not vaccinated, 51.48 per cent.

In the two Public Schools for colored children (included in the above.) I find 120 on roll, of whom there were present

49 boys, and of these	38	were not vaccinated....	77.5 per cent.
22 girls, " "	15	" "	68.1 per cent.
71 " "	53	" "	74.6 per cent.

Respectfully,

Wm. P. Tonry, Ph. D., M. D.,
Inspector State Board of Health.

REPORT ON VACCINATION—Continued.

NAME OF SCHOOL	NAME OF TEACHERS.	GRADE.	On Roll		Present		N'tVaccinated.		AGE OF THOSE PRESENT.		Date of Visit.	LOCATION OF SCHOOL.	REMARKS.
			Boy.	Girl.	Boy.	Girl.	Boy.	Girl.	Boys.	Girls.			
Allegany County Academy.	Mr. J. S. Crockett......	....	23	....	21	....	2	....	10 to 17	....	3, 6, '91	Washington St..	Mr. J. S. Crockett. Principal.
	Miss Georgie Houghton	....	....	25	....	12	....	....	....	12 to 18			
	" Sue Thruston.....	Primary..	7	14	5	12	....	....	8 to 12	7 to 11			
			30	39	26	24	2	....					
Allegany County High School.	Miss Constance Salmon	High School Gr.	20	38	16	31	1	1	14 to 17	13 to 19	3, 4, '91	Union Street....	John T. White. Principal.
	" Maud Spencer.....	6th..............	25	29	19	23	3	1	12 to 16	13 to 17			
	" Laura Young......	5th..........	27	23	17	16	1	....	11 to 16	12 to 17			
	" Ella Clarke........	4th..........	25	31	19	22	1	6	10 to 15	10 to 16			
	" Stella Macbeth....	4th..............	27	30	22	20	8	8	8 to 15	9 to 14			
	" Stella Weiner.....	3rd and 2nd	22	29	12	22	3	7	9 to 13	8 to 13			
	" Rebecca Sipes.....	Part of 2nd	31	28	20	23	11	14	8 to 11	8 to 12			
	" Jessie White......	2nd and 1st......	36	28	23	12	20	10	7 to 12	7 to 9			
	" Mary Hilleary.....	1st	31	39	17	18	17	13	6 to 9	6 to 10			
			244	275	165	187	65	60					
Centre St. School	Miss B. A. Noone.......	5th and 6th......	20	23	14	19	2	5	12 to 16	11 to 17	3, 4, '91	North Centre St	
	" L. E. Taafel.......	4th..............	25	21	16	13	6	6	11 to 16	11 to 16			
	" Lizzie Lingo	4th..............	22	24	17	15	7	9	9 to 12	9 to 13			
	" Lizzie Leonard ...	3rd..............	23	20	13	15	7	9	10 to 13	9 to 13			
	" Bessie Reid........	3rd..............	30	22	24	13	14	6	8 to 12	7 to 11			
	" Maggie Rowe	2nd	27	25	16	17	14	17	7 to 9	8 to 11			
	" Clare Butler	1st..............	31	17	21	13	15	10	7 to 11	7 to 11			
	" Ella Scott.........	1st..............	23	28	19	21	14	20	6 to 9	6 to 9			
			201	180	140	126	79	82					
Maryland Avenue School.	Mr. J. E. J. Buckey....	6th, 5th and 4th.	14	22	6	7	2	1	10 to 15	11 to 14	3, 4, '91	Maryland Ave..	J. E. J. Buckey, Principal.
	Miss Carrie Kephart...	3rd and 2nd	26	23	16	16	9	15	8 to 14	8 to 13			
	" Emma Everstein..	1st..............	24	22	15	10	14	8	6 to 9	6 to 9			
			64	67	37	33	25	24					
Green St. School	Miss Alice McMichael..	6th, 5th and 4th.	15	14	13	13	4	1	8 to 16	9 to 13	3, 4, '91	Green Street....	Miss Alice McMichael Principal.
	" Marion Spear	3rd, 2nd and 1st.	18	28	16	16	9	10	6 to 11	6 to 11			
			33	42	29	29	13	11					
Mary Hoye School	Mr. J. C. Johnson (col'd).	....	25	16	18	6	10	2	9 to 14	12 to 14	3, 6, '91	Independence St	Mr. J. C. Johnson (colored), Principal. Teachers and Pupils are Colored,
	Miss Mary W. Sims, "	....	24	16	12	11	10	9	6 to 13	6 to 17			
			49	32	30	17	20	11					
Baptist School....	Miss Alice B. Peyton,"	....	25	14	19	5	18	4	6 to 15	8 to 15	3, 4, '91	Cumberland St.	In Basement of Baptist Church. Teachers and Pupils are Colored,
			25	14	19	5	18	4					
			646	649	446	421	222	192					

REPORT ON VACCINATION—Continued.

NAME OF SCHOOL	NAME OF TEACHERS.	GRADE.	On Roll		Present		N't Vaccinated		AGE OF THOSE PRESENT.		Date of Visit.	LOCATION OF SCHOOL.	REMARKS.
			Boy.	Girl.	Boy.	Girl.	Boy.	Girl.	Boys.	Girls.			
St. Patrick's	Sister Belinda		....	42	....	22	....	15	....	9 to 13	3, 4, '91	North Centre St	Father M. J. Brennan Pastor.
	" Michael		....	30	....	20	....	8	....	12 to 17			
	" Chrysostom		50	45	16	16	13	11	5 to 12	5 to 13			Catholic Schools attached to St. Patrick's church.
	" Bernard		38	....	29	....	11	....	8 to 13	....			
	" Cecila		30	....	17	....	9	....	12 to 15	....			
			118	117	62	58	33	34					
St. Peter and Paul's.	Sister Leonard		60	....	42	....	33	....	9 to 14	....	3, 4, '91	Fayette Street..	Father Felix, Pastor.
	" Hyacinth		55	. .	45	....	32	....	7 to 12	. .....			Catholic Schools attached to St. Peter and Paul's Church.
	" Ursula		37	32	16	16	16	16	6 to 9	5 to 9			
	" DeChantel		...	54	....	26	....	15	....	7 to 15			
	" Clara		....	65	....	54	...	26	....	10 to 14			
			152	151	103	96	80	57					
German English Lutheran School.	Rev. C. Wagner		25	....	23	....	7	....	6 to 14	....	3, 5, '91	Bedford Street.	
	Mrs. C. Wagner		....	45	....	31	. ..	14	....	6 to 14			
			25	45	23	31	7	14					
Evangelical Lutheran Trinity Congregational School.	Rev. J. F. W. Kuhlman		24	20	23	17	14	6	8 to 14	7 to 15	3, 5, '91		
			24	20	23	16	14	6					
			319	333	211	202	134	111					
Resume	Public Schools	White	572	603	397	399	184	177					
	" "	Colored	74	46	49	22	38	15					
			646	649	446	421	222	192					
Resume	Catholic Schools	White	270	268	165	154	113	91					
"	Lutheran Schools	White	49	65	46	48	21	20					
			319	333	211	202	134	111					

REPORT OF C. O. MILLER, M. D., ON THE BIOLOGICAL EXAMINATION OF WATER AT CUMBERLAND, MD.

BALTIMORE, April 29, 1891.

DR. C. W. CHANCELLOR,
Secretary State Board of Health:

DEAR SIR—The water for examination was collected by me in sterilized flasks from the following sources on March 12th and 14th:

1. From the river at entrance to pipe which conveys the water from the river to the receiving cistern at pump house.
2. From the receiving cistern at pump house.
3. From the spigot on the main going from the pumps to supply the city.

The water from each of these sources was decidedly cloudy, gave a very perceptible sediment on standing, gave no odor, and had suspended in it some brownish flakes. A bacteriological examination was made to determine the number of bacteria per cubic centimeter,* and to study the varieties of bacteria present with reference to the presence of typhoid bacillus.

Soon after the water was drawn, Agar-Agar Esmarch tubes were made in the usual way with aseptic precaution, the tubes were kept in a warm place, and as soon as the colonies developed they were counted; the number of colonies corresponding to the number of bacteria present in one cubic centimeter of water at the time that the cultures were made. A number of cultures were made from each source, and the following averages were obtained:

1. River water at entrance pipe, 1,056 per cubic centimeter.
2. Receiving cistern at pump house, 3,256 per cubic centimeter.
3. Spigot on the main going from the pumps to supply the city, 5,554 per cubic centimeter.

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* Four cubic centimeters are equal to 1.08 drachms, which is a teaspoonful.

We thus see that there is an increase in the number of bacteria, from the time that the water enters the pipe at the river until it is distributed from the pumps for city consumption.

The increase can be accounted for in several ways: First, by a stagnation of the water and a multiplication of the bacteria which were present in the water when it left the river ; secondly, contamination of the water in the pipes of the receiving cistern by the influx of contaminated surface or ground water, or thirdly, from an accumulation of filth in the bottom of the well under the engine, which would furnish a suitable nidus for the growth of bacteria.

The number of bacteria in the water supplied to the city is largely in excess of the number found in a potable water. Water which contains several hundred bacteria per cubic centimeter is considered in a general way as not being injurious; if the number exceeds 500 per cubic centimeter, the source of the water supply and chances of contamination with sewage require a careful study. It is also necessary to take into consideration the number of different varieties of bacteria present. Among the great number of varieties which grow in water, there are usually a comparative small number that are injurious to the human body. An attempt was made to discover the typhoid bacillus if it was present. Inasmuch as typhoid bacillus resembles many other bacteria in its morphology and growth, it is difficult to pick it out from such a large number of varieties as were present in the water. Several bacteria were found which had some resemblance to the typhoid bacillus, but I failed to find any that were identical with it in every respect.

The failure to find the typhoid bacillus in a given water supply at a given time, does not permit me to conclude that the water supply is free from suspicion.

The water was taken from the river at a time when there had been a good deal of rain for some weeks previously, and we can fairly conclude that the water of the river itself had more bacteria in it than usual. Dr. Theobald Smith found in the Potomac River water at Washington, that the number of bacteria were largest when there was the greatest turbidity and deposit in the water, and that this was most marked in the winter months.

Dr. Smith's* table giving the monthly average number of bacteria found in 1 c. c. of Potomac drinking water during 1886.

	No. observation.	Average.	Rainfall in in.
January	2	3774	3.46
February	4	2536	2.79
March	5	1210	4.16
April	4	1521	4.21
May	3	1069	8.77
June	2	348	4.98
July	2	255	8.42
August	1	254	1.02
September	2	128	1.04
October	3	75	1.04
November	1	116	3.69
December	2	967	3.07
January	3	882	3.19

Dr. Smith says in reference to the relation between the rainfall and the number of bacteria in the water, that "the heaviest rains occurred in July, but the number of bacteria did not rise perceptibly and no turbidity appeared. The precipitated water is caught by the foliage of the trees, by the grass and herbage which clothe the soil everywhere. The soil is at the same time more firmly bound together by the vegetation itself. In winter all this is changed. The absence of vegetation itself leaves the loose soil ready to be washed into streams by rain and melting snow, carrying with it the bacterial vegetation."

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* Medical News, April 9th, 1887, reprint in American Monthly Microscopical Journal, July, 1887.

From a bacteriological examination alone the water of the river, as it enters the pipes, could not under the condition existing at the time the examination was made, be said to be particularly impure, but the water as supplied to the city, after having passed through the receiving cistern and pump well, contains by far too many bacteria to be classed as a potable water.

The sediment at the bottom of receiving cistern and the water in the cistern were examined microscopically for other forms of life than bacteria. I found eight varieties of diatomes, but they were not very numerous. A few encysted forms belonging to the protozoa were found, from which I was enabled to cultivate one variety of ciliata, one variety of amsiba, and some flagellata. From our present knowledge we are not in a position to attach much importance to the presence of these protozoa.

By the kindness of Dr. M. A. R. F. Carr, I was enabled to examine a case of the prevailing fever, and to obtain some of the fæces for bacteriological examination. The case was that of a girl 8½ years of age in the 15th day of the disease; she was the fourth case that had occurred in that family during the past winter. She presented most of the characteristic symptoms and appearance of a case of typhoid fever. From the fæces I was enabled to isolate a bacillus, which, when submitted to all the usual tests for establishing the identity of the typhoid bacillus, presented all the morphological characteristics, modes of growth and reactions as the typhoid bacillus.

I also examined the water from three cisterns; each of the samples were clear and colorless, and without any sediment except that No. I contained a few fragments of leaves. They contained the following numbers of bacteria per cubic centimeter:

No. I. Hon. Lloyd Lowndes' cistern, 120 per c. c.

No. II. Court House cistern, 116 per c. c.

Supplied drinking water for Mr. Millholland.

No. III. Gen. Sprague's cistern, 5204 per c. c.

Samples Nos. I and II are in marked contrast to the water from the city water works and cistern No. III.

The sanitary inspection of the surroundings of the cistern, together with the bacteriological examination, indicate that the water in Nos. I and II is good for drinking purposes. No. III is very much richer in bacteria than it should be, and the surroundings are such that the water should be condemned until the cistern is re-cemented and the surroundings improved.

Respectfully submitted,

C. O. MILLER, M. D.

PART IV.

CORRESPONDENCE ON IMPORTANT SANITARY MEASURES.

THE BURIAL OF THE DEAD AT ROCKVILLE, MD.

ROCKVILLE, MD., Sept. 15, 1890.

DR. CHANCELLOR,
Secretary State Board of Health,
Baltimore, Maryland:

DEAR SIR—The question of passing an ordinance prohibiting the interment of bodies within the corporate limits of our town is receiving careful consideration by our town authorities. Do you believe a burial place surrounded by a thickly settled population likely to be the cause of disease, and if so, what will be the character of the disease or the diseases caused? Will typhoid fever be produced?

Would you, upon invitation of our Town Council, attend a meeting of the citizens called to meet October 7th, for the purpose of making some remarks?

An early reply will greatly oblige.

Yours truly,
D. F. OWENS, *Mayor.*

SECRETARY'S OFFICE,
STATE BOARD OF HEALTH.
BALTIMORE, MD., Sept. 16, 1890.

D. F. OWENS, *Mayor of Rockville, Md.*

DEAR SIR—I have the honor to acknowledge receipt of your favor of the 15th inst,, asking my opinion as to whether "burial places when surrounded by a thickly settled population are likely to be the cause of disease, &c., and whether I will "upon invitation of the Town Council attend a meeting of the citizens called to meet October 7th, for the purpose of making some remarks" on the above subject.

I cannot tell so far in advance whether it will be possible for me to attend the proposed meeting, but if nothing unforseen prevents, I shall be pleased to comply with a request coming from the municipal authorities of Rockville.

In regard to your first question, it is one which involves considerable interest to several communities in the State, and I will reply to it somewhat in detail, in order that you may if you should see fit to do so, give publicity to the matter through your local papers.

The hygienic dangers from burial, *per se*, were recognized by the ancients; although they did not have the aids of modern chemistry, they seem to have discovered the fact that decomposing animal remains are not devoid of danger, but were capable of and did produce disease and death among the living.

That burial, as frequently performed at the present time, does not render the dead body innocuous has been demonstrated time and again, and under almost every variety of circumstances. The dangers to be apprehended from earth burials are usually classified as follows:

FIRST. Contamination of water supply.

SECOND. Contamination of air supply.

THIRD. Direct infection, should it become necessary to re-open graves.

That these are not imaginary or fictitious dangers I firmly believe, and that they have been directly recognized in numerous well authenticated instances is simply a matter of history. Undoubtedly earth burial can be performed in such a manner as to be practically harmless to the living, if the following suggestions be followed: (1) That no more dead be buried in the soil than the pure oxygen contained in rain and dew carried through it will decompose; (2) that the soil of the grave-yard be left undisturbed until the processes of decay are complete in each corpse; (3) that the dead be laid in a sufficient space of properly planted ground and at a distance of at least one mile from any considerable number of houses; and (4) that especial care be always taken to study the drainage of the ground with reference to the neighboring sources of water supply. Shallow surface wells, near a cemetery, are invariably open to suspicion, as the water may be tainted by organic matter filtered through the soil. I am inclined, however, to think it very exceptional that any attention is paid either to the drainage, the number of bodies placed in a given space, or to any of the requirements admitted to be necessary to a healthy and well ordered cemetery. Cemeteries in small towns, so far as my observation goes, are rarely laid out with any reference or thought as to their sanitary requirements, convenience alone being consulted; consequently they are usually near the church, often in the heart of the town, or upon some knoll whose drainage is oftentimes directly into the wells in the valley below.

It is charitable to believe those persons mistaken who are so positive in their belief that there is no evidence in support of the unhealthfulness of cemeteries and the infectious nature or qualities of the dead. Such mistakes are hardly excusable, however, when we consider the many authentic records with which the literature of the subject abounds. The danger to public health from intramural interment was recognized by the ancient Greeks, Romans and Egyptians, and the practice was prohibited among them for this, and no other reason. In Europe the municipal authorities and all the churches have been forced to recognize the evil and prohibit it, notwithstanding the churches had the strongest of pecuniary and other reasons for continuing the custom.

History teems with accounts of epidemics caused by animal decomposition. St. Augustine, Lucian, Marcellinus and other historians relate numerous instances of plagues arising from this cause. Subsequently Piattoli, Navier and Vicq'd Azyir made exhaustive studies of the subject, and published voluminous works containing arguments that modern chemistry has confirmed and not refuted. Later still Ambrose Pare published numerous instances of pestilences caused by emanations from pits filled with dead bodies. But as it may be charged that this is evidence "dug up" from past centuries, I will not quote further from the history of the forgotten past, but pass on to more recent dates, and see if we can find any evidences of the noxious properties of earth burial.

In 1849 the city government of London had the question of the healthfulness of the city cemeteries investigated, and for this purpose a commission of gentlemen, selected for their high medical and scientific skill, were appointed, and their unanimous opinion, after a thorough examination into all the facts *pro* and *con*, was that the cemeteries were dangerous to public health, and had been the cause of numerous and severe epidemics. In their reply they say: "We may safely rest the sanitary part of the case on the single fact that the placing of the dead body in a grave, and covering it with a few feet of earth, does not prevent the gases generated by decomposition, together with putrescent matter which they hold in suspension, from permeating the surrounding soil and escaping into the water beneath and the air above." The commission further states, in speaking of certain churchyards, "In all the houses adjoining them cholera or diarrhœric disease has occurred." Again the report states that "cholera was unusually prevalent in the immediate neighborhood of London churchyards."

Dr. Lyon Playfair and Sir Henry Thompson, of London, both testify that thousands of human lives have been cut short by the poison of slowly decaying and oftentimes diseased animal matter, such as found in graveyards. The latter, an authority whom few will care to question, says: "The graveyard pollution has probably found a victim in some social circle known to more than one who may chance to read this, and I need hardly add that in times of pestilence its continuance has been often due mainly to the poisonous influence of the buried dead."

As to the exact manner in which cemeteries are detrimental to health, as yet comparatively little is really known. That the decaying human body, *per se*, is capable of producing any specific disease, I think no one will claim; neither is it evident that sewer gas, decomposing animal or vegetable matter, or the thousand and one influences confessedly injurious to health, are capable of producing any one particular malady. The gases which escape through the soil from decomposing human bodies may produce disease by being the bearer of contagious and infectious germs; but more frequently by lowering the grade of vital energy of the individual, and rendering him more susceptible to the action of the peculiar disease germ, virus, or entity, whatever it may be. Among the diseases supposed to be produced in this manner may be mentioned typhoid and typus fevers, yellow fever, cholera, perhaps diphtheria and scarlet fever, and numerous other diseases, distinguished by the property of being conveyed to the human body from the soil, hence designated as filth diseases.

These facts accepted, we can readily see the risks we run from the practice of interring the dead in proximity to the living, an evil which has been the subject of sanitary regulation from the earliest times.

Very respectfully yours,

C. W. CHANCELLOR, M. D.,
Secretary State Board of Health.

ROCKVILLE, MD., Sept. 17, 1890.

DR. CHANCELLOR,

Secretary State Board of Health.

DEAR SIR—Your favor received. Please accept my thanks for the promptness and fullness with which you have replied to my inquiry, whether the burial of bodies within a thickly settled community would cause disease.

I am authorized by the Town Council to invite you to meet the citizens and give your views October 7, at 7.30 P. M. A return train to Baltimore leaves here at 9.37 P. M.

Yours very truly,

D. F. OWENS, *Mayor.*

Not being able to visit Rockville at the time appointed the following letter was subsequently received from Mayor Owens.

ROCKVILLE, MD., Oct. 10, 1890.

DR. C. W. CHANCELOR,

Secretary State Board of Health.

MY DEAR SIR—The Town Council met last night to determine the advisability of passing an ordinance prohibiting future interments within the corporation limits.

A majority of the members were unwilling to come to a vote until you had inspected in person the surroundings and had reported your opinion.

The town would be greatly indebted to you if you will at your earliest convenience visit our town, and give the Council your opinion.

Yours respectfully,

D. F. OWENS, *Mayor.*

To which the following reply was returned :

State Board of Health,
Secretary's Office.
Baltimore, Md., Oct. 18, 1890.

Hon. D. F. Owens, *Mayor of Rockville, Md.*

Dear Sir—At your request I have visited and inspected the several grave-yards in the town of Rockville, with the view of aiding your municipal authorities in forming an opinion as to the probable effect of such places upon the health of the town, and in taking such steps as may be deemed necessary to protect the public health.

So far as I am able to judge from a cursory examination, there are no grounds that would justify the State Board of Health in interposing its authority in the case ; but I am convinced that should the practice of burying the dead in these places, already quite full, be continued, dangers are likely to arise, if they do not already exist, from the following causes :

1. The contamination of the water supply of the town.
2. The contamination of the air supply.
3. The evils of direct infection.

If, however, no more dead bodies be buried in these grounds, and the soil be left undisturbed until the processes of decay are complete, they will probably not become so harmful as to require the removal of the bodies already buried therein, or to render it necessary to close all wells of drinking water in the immediate neighborhood.

I should not deem this part of the subject worthy of further consideration, but should treat it as a well-established fact, that there are dangers to be apprehended, were it not that the members of your Municipal Council have expressed a wish for additional evidence in support of the views I have already advanced.

I am aware that it is a pretty hard matter to change a long-established custom, or to "convince people against their will," but it seems to me that in this case the evidences are overwhelming that there are dangers more or less serious to be apprehended from the present plan of inhumation practiced in Rockville and other towns in the State. But to draw the line, and say at what point it shall be considered unsafe longer to bury the dead in an established cemetery, is a problem requiring judgment open to criticism from one side or the other, and it is not befitting that I should attempt more than to give the experience of those who have made the subject a special study.

In this connection, I would call your attention to a valuable report recently made by Dr. Levison, at the International Congress of Medical Sciences held at Copenhagen, "On the Influences of Cemeteries on Public Health." After a thorough and scientific investigation, based upon personal observation, and upon official information received from boards of health, municipal authorities, the clergy, and practitioners of medicine throughout the country, Dr. Levison concludes that, "The bad effect of cemeteries upon the public health has been repeatedly demontrated. On many occasions," he says "the origin of pestilential diseases has been traced to wells or springs which have been contaminated by the presence of cadaveric decomposition. Out of 68 towns, in which exact data could be obtained, ten were demonstrated to have suffered repeatedly from infectious diseases arising from and aggravated by environing cemeteries. In the country districts seventy-eight epidemics, mostly of typhoid fever, were caused by cemeteries. Several schools situated in the vicinity of grave-yards had to be abandoned on account of the prevalence for many years of typhoid fever and diphtheria in those establishments."

With such incontrovertible evidence of the dangerous results arising from the practice of interring the dead in immediate proximity to the living, I am clearly of the opinion that graveyards should not be maintained near human habitations. It is necessary to banish them from the town, not only to correct present evils, but to protect all who come after us. The argument employed by those who think that the danger has not been proved is that there is no immediate, no pressing need of reform; that the burying ground or the neighborhood is not overcrowded, and that we may safely wait for the approach of danger. This is not a wise or a humane argument. Posterity, it is true, has done nothing for us: one of the reasons of our being here is to prepare the way for those who are to follow us—plan all things for their safety and make the earth a pleasant dwelling place for them. We would not allow a "potter's field" to be established within the limits of any incorporated town, nor would we hesitate to stop the burial of bodies in one that already existed; but the rich and the poor are in no wise different when they come to the grave, and the bodies of both should be subject to the same hygienic regulations, for both are liable to the same changes after death, and have to pass through the same process of decay.

To retain the dead in our midst is a blot on our civilization, since it serves to corrupt nature by storing up under our very noses the accumulated decay of many years We may endeavor to gratify feelings of affectionate remembrance by keeping the dead near our dwellings, but it is all in vain. It is the law of nature that their bodies shall decay, and their elements pass again into the living world and so circulate for ever. I am disposed to allow great weight to what is called sentiment, in the solution of this as well as every other social problem, provided that sentiment does not conflict with the health and happiness of the living; but better far, and more intelligible to me, is the sentiment of the Hindoo, who "sees in the ascending smoke of the funeral pyre the soul of the departed wending its way to realms of bliss, and in the handful of ashes cast upon the waters of the Ganges, the reunion of the body with the universe."

Very respectfully yours,

C. W. CHANCELLOR, M. D.,

Secretary State Board of Health.

HOW DEADLY GERMS ARE SPREAD.

CORRESPONDENCE IN REFERENCE TO THE OUTBREAK OF DIPHTHERIA AT PROSPECT, MD.

Rules of the National Association of General Baggage Agents in reference to the Transportation of Corpses —Adopted with Occasional Modifications by many State Boards of Health.

RULE 1. The transportation of bodies of persons dead of diphtheria, small-pox, Asiatic cholera, leprosy, typhus fever, or yellow fever, is absolutely forbidden.

RULE 2. The bodies of those who have died of anthrax, scarlet fever, puerperal fever, typhoid fever, erysipelas, measles, and other contagious infections, or communicable diseases, must be wrapped in a sheet thoroughly saturated with a strong solution of bichloride of mercury, in the proportion of one ounce of bi-chloride of mercury to a gallon of water; and encased in an air-tight zinc, tin, copper or lead lined coffin, or in an air-tight iron casket, hermetically sealed, and all enclosed in a strong, tight wooden box; or the body must be prepared for shipment by being wrapped in a sheet and disinfected by solution of bichloride of mercury as above, and placed in a strong coffin or casket, and said coffin or casket encased in a hermetically sealed (soldered) zinc, copper, or tin case, and all enclosed in a strong outside wooden box of material not less than one inch and a half thick.

Rule 3. In cases of contagious, infectious, or communicable diseases, the body must not be accompanied by articles which have been exposed to the infection of the disease. And in addition to permit from Board of Health or proper health authority, station agents will require an affidavit from the shipping undertaker, stating how body has been prepared and kind of coffin or casket used, which must be in conformity with Rule 2.

Rule 4. The bodies of persons dead of diseases that are not contagious, infectious, nor communicable, may be received for transportation to local points in same State, when encased in a sound coffin or metallic case, and enclosed in a strong wooden box, securely fastened so it may be safely handled. But when it is proposed to transport them out of the State to an interstate point (unless the time required for transportation from the initial point to destination does not exceed eighteen hours) they must be encased in an air-tight, zinc, tin, copper or lead-lined coffin, or an air-tight iron casket, or a strong coffin or casket encased in a hermetically sealed (soldered) zinc, copper or tin case, and all enclosed in a strong outside wooden box of material not less than one inch thick. In all cases the outside box must be provided with four iron chest handles.

Rule 5. Every dead body must be accompanied by a person in charge, who must be provided with a ticket, and also present a full first-class ticket marked "Corpse," and a transit permit from Board of Health, or proper health authority, giving permission for the removal, and showing name of deceased, age, place of death, cause of death, (and if of a contagious or infectious nature) the point to which it is to be shipped, medical attendant and name of undertaker.

Rule 6. The transit permit must be made with a stub to be retained by the person issuing it, the original permit must accompany the body to destination, and two coupons. The first coupon to be detached by station agent at initial point and sent to the general baggage agent, and the second coupon by the last train baggageman. The stub, permit and coupons must be numbered, so the one will refer to the other, and on permit will be a space for undertaker's affidavit, to be used in cases of contagious or infectious diseases, as required by Rules 2 and 3.

Rule 7. The box containing corpse must be plainly marked with paster, showing name of deceased, place of death, cause of death, the point to which it is to be shipped, number of transit permit issued in connection, and name of person in charge of the remains. There must also be blank spaces at bottom of paster for station agent at initial point, to fill in the form and number of passage ticket, where from, where to, and route to destination of such ticket.

Rule 8. It is intended that no dead body shall be moved which may be the means of spreading disease, therefore, all disinterred bodies, dead from any disease or cause, will be treated as infectious and dangerous to the public health, and will not be accepted for transportation unless said removal has been approved by the State Board of Health, and the consent of the health authority of the locality to which the corpse is consigned, has been first obtained, and the disinterred remains enclosed in a hermetically sealed (soldered) zinc, tin, or copper lined coffin or box, or box encased in hermetically sealed (soldered) zinc, tin, or copper lined case.*

The importance of complying strictly with the foregoing rules, points a plain public and private moral when taken in connection with the circumstances attending the outbreak of diphtheria in the family of Mr. Arthur Thomas, of Prospect, Harford County, Maryland. The details are given in the following correspondence, which it would be well for the head of every family, as well as every practicing physician, to read, since it recites how, in a single instance, no less than four or five lives paid the penalty of a disregard of general sanitary laws, and of the requirements from railroad companies in regard to the transportation of dead bodies, and the State law in regard to contagious and infectious diseases.

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* The approval of the State Board of Health for disinterment must be attached to the transit permit.

The law of 1890, chapter 622, provides that where death is due to contagious or infectious disease, it shall be reported to the health authorities by the attending physician, so that every necessary precaution may be taken to prevent its spread, and the importance of a strict compliance with this law is terribly emphasized by the facts below recited. Every State in the union, and every civilized community, in fact, is forced by regard for its own existence, to make such regulations, and while it may be natural that friends and relatives should sometimes regard their enforcement as harsh, physicians, who by virtue of their calling are custodians of the public health, should never allow any consideration to cause them to hesitate in the discharge of their duty. And even relatives, in such cases, ought to be willing to sacrifice their own feelings for the dead to the welfare of the living.

It is hard in the shadow of a great and crushing sorrow to stifle the natural impulse that leads the bereaved to the side of his dead, to turn away from the form that is soon to be put away out of human sight forever, and to leave to cold and unsympathetic strangers the offices which belong ordinarily only to friendly hands. But experience shows the danger of yielding to such feelings where the disease has been a contagious or infectious one, a danger not merely to the family in which it has occurred, but to the community in general.

Under such circumstances there arises a new and higher duty than that of affection or ceremonial respect to the dead—the duty to the living. Nothing more can be done for the former, and for the sake of the latter, friends and relatives should abstain from every act which may give the disease a fresh foothold or transplant it to a new victim. When the necessity for such self-abnegation meets us it may and does add to the keenness and weight of sorrow, but it ought to nerve every one to the performance of duty to remember, that every selfish indulgence of grief on such occasions, may cost many other lives in their own and other families.

CORRESPONDENCE.

Belair, Md., July 18, 1890.

Dr. C. W. Chancellor,

Dear Sir—The absence of our local Health Board from town has prevented us from reporting to you at an earlier date the cases of diphtheria at Prospect. The history of the case is this:

The body of a grandchild of Arthur Thomas was brought from Wilmington, Delaware, by him and his daughter, Mattie F., on the 17th of June. The body was permitted transportation by railroad on a certificate naming "lung trouble" the cause of death. The coffin, an ordinary casket, without zinc lining or any antiseptic precaution taken, was opened and a public funeral held June 18th. The following Friday, June 20th, Mattie F., age 18 years, was taken with diphtheria, died 23d, buried privately same day. Sallie F., age 11, taken June 23d, died 30th and buried privately same day. Maggie T., age 12, taken June 26th, died July 6th, buried July 7th privately. Robert T., taken July 5th, died 8th and buried 9th. Benjamin T., taken July 5th, died 8th and was buried at same hour with Robert. David T., adult, taken July 5th, had slight attack and recovered. Oliver T., adult, was sick a few days, though suffered no throat trouble. I found the excreta, vomit and sputa had been put in a hole and covered with earth, though no disinfectant used. Ordered the place heavily limed and more earth thrown on, and not to open. I also found that Dr. M. E. Pue, the attending physician, had made every endeavor to have the place put in sanitary condition, sulphur burned, house fumigated and bichloride mercury used in washing bedsteads, floors, etc., freely. I ordered the two beds used by the patients, a carpet and bed clothes to be burned and replaced by County Health Board.

From reliable reports gained from the neighbors, I learned that the physician attending grandchild in Wilmington refused to give certificate to be used on railroad, and the certificate obtained was gotten from another physician.

I remain, very respectfully,

I. C. BUTLER,
Health Officer.

LETTER FROM DR. PUE THE PHYSICIAN WHO ATTENDED THE CASES.

WEST BANGOR, PA., Aug. 7, 1890.

DR. C. W. CHANCELLOR, *Baltimore, Md.*

MY DEAR SIR—In reply to your favor of the 5th inst., will give you all the information I have obtained in the matter. Name of child, William Thomas, brought over Philadelphia Wilmington and Baltimore Railroad to Perryville, and Columbia and Port Deposit Railroad to Conawingo Station from Wilmington, and all of the Pennsylvania System. I am not positive as to the name of physician issuing certificate though think it is Wilson. Will send you any additional information I may get. The Thomas family are very reticent in the matter now, as they are afraid of implicating themselves though they have admitted that the child died in Wilmington of diphtheria.

Yours truly,

M. E. PUE, M. D.

P. S. I will do any thing in my power to help bring to justice the fellow who issued the certificate with such terrible consequences.

REPORT OF DR. I. C. BUTLER, COUNTY HEALTH OFFICER OF HARFORD COUNTY, ON THE SPREAD OF DIPHTHERIA AT PROSPECT.

BELAIR, MD., August 12, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health.

DEAR SIR: By your directions I visited both James and Joseph Burkins last Tuesday, August 27th, 1890. Dr. M. E. Pue, the attending physician, very kindly met me there. At Joseph Burkins' I found his niece, Mary Bell Henry, age 8 years, had been taken sick on August 11th, Dr. Pue called in on August 19th, and pronounced the disease diphtheria, from which she died on the 23d, and was buried 24th.

Annie Burkins, age 24 years, taken on 20th, and still under medical attention.

At Joseph Burkins' I found Alice B., his daughter, age 13 years, was taken with diphtheria, August 13th, and recovered.

Lucy B., another daughter, age 10 years, taken 18th August, and still under medical treatment.

I also found at this house that the excreta, vomit and sputa from the cases had been emptied on the bank of the overflow from a spring that emptied immediately into a run used for domestic purposes.

I ordered a pit dug two feet deep and one hundred feet from the flow of water, to be used for emptying the excreta, &c., and also ordered disinfectant of carbolate of lime to be used freely. Both families I quarantined and ordered notice of the disease to be posted at gate.

From reliable sources I learned that the spread of the disease from its proscribed limit at Arthur Thomas' was due to the intercourse between the families most intimate in their relations, and also learned that clothing belonging to the children, now dead, of Arthur Thomas had been given to the children of Joseph Burkins and worn by them.

In conclusion, I would say, Dr. Pue very politely asked me to see the cases still under treatment. I found both cases that of malignant diphtheria, and answering very nicely to his heroic treatment. I also would express my pleasure in finding the great precaution taken by Dr. Pue in confining the disease to the present limit. I am,

Very respectfully,
I. C. BUTLER, M. D.,
County Health Officer.

After receiving the above letter, the following was addressed to the Superintendent of the Philadelphia, Wilmington and Baltimore Railroad:

SECRETARY'S OFFICE,
STATE BOARD OF HEALTH,
BALTIMORE, August 15, 1890.

H. H. CARTER, ESQ.,
Superintendent P. W. & B. R. R.,
Wilmington, Del.:

DEAR SIR—I am informed (see enclosed letter) that the corpse of a child dead of diphtheria was transported by your road about the 18th of June last to or near Prospect, Harford County, and from this unfortunate circumstance Mr. Arthur Thomas, of Prospect, has lost six children with the disease. Will you kindly give me all the information you can in reference to the matter, especially with regard to the certificate upon which the body was received by the railroad authorities? Yours truly,

C. W. CHANCELLOR, M. D.,
Secretarg State Board of Health.

REPLY OF SUPERINTENDENT CARTER.

WILMINGTON, DEL., August 16, 1890.

C. W. CHANCELLOR, M. D.,
Secretary, etc., Health Department,
Baltimore, Md.:

DEAR SIR—I am in receipt of your favor of the 15th instant, with regard to the corpse of a child having been forwarded from Wilmington, which, it is alleged, died of diphtheria. We have gotten a copy of the permit, which I enclose you, issued by the Board of Health of Wilmington, for the burial of this child, which states that it died of pneumonia.

Our baggage agent advises us that Undertaker Wilson informed him this morning that the child did not die of a contagious disease, and that he [the undertaker] holds the doctor's certificate showing that the child died of pneumonia.

We return you herewith the letter sent us with your favor.

Yours respectfully,

H. H. CARTER, *Superintendent.*

PERMIT FOR BURIAL IN THE CITY OF WILMINGTON, DEL.

Died, June 17th, 1890. Name, William E. Thomas. Single. Native of Maryland, United States of America. Sex, male. Color, white. Age, 4 years. Residence, 314 South Franklin street. Disease, pneumonia. Name of parents—Father, Edwin Arthur Thomas; mother, Josephine Thomas.

M. F. CORKRAN, *Physician.*

Permission to bury the above-named person is hereby given to J. A. Wilson, undertaker.

WM. H. LEE, *Registrar.*

WILMINGTON, DEL., June 17, 1890.
Interment at Conowingo, Md., Cemetery.

SECRETARY'S OFFICE.
STATE BOARD OF HEALTH.
BALTIMORE, MD., Aug. 19, 1890.

H. H. CARTER, ESQ.
Superintendent P. W. & B. R. R.

DEAR SIR—In acknowledging your favor of the 16th inst., I desire to thank you for the information conveyed. Information from other sources leads me to think there was some irregularity practiced in giving the certificate upon which the corpse was transported by your road. There can be no doubt of the fact that the child died of diphtheria and that, subsequently, seven members of Mr. Thomas' family contracted the the disease from viewing the corpse, which was exposed by opening the casket after it had arrived at its destination.

Of the seven cases of diphtheria in Mr. Thomas' family, following the exposure of the corpse, six died of the disease in a malignant form, and, at last advices, the seventh was in a precarious condition.

I do not find in your letter or in the certificate anything to indicate that the body was disinfected or prepared in the manner required by the rules governing the transportation of corpses by railroad companies, though I take it for granted your baggage agent required these rules to be observed before receiving the body. Very truly yours,

C. W. CHANCELLOR, M. D.,

Secretary and Executive Officer.

To this letter no reply was made.

LETTER FROM COUNTY COMMISSIONER SCARBOROUGH.

PROSPECT, HARFORD CO., Aug. 26, 1890.

DR. C. W. CHANCELLOR,

Secretary and Executive Officer,

Maryland State Board of Health.

DEAR SIR—I take the liberty as a member, *ex-officio*, of the County Board of Health, to call your attention to the epidemic of diphtheria prevailing in this part of the county. I am aware of the fact that Dr. I. C. Butler, our local Health Officer, has been in communication with you in reference to the outbreak of the disease, and it is unnecessary therefore, for me to go into details as to its origin. The corpse of the child was brought here from Wilmington, Delaware, on a bogus certificate, and I think the guilty parties should be brought to justice. The disease undoubtedly had its origin from the corpse brought to Mr. Thomas' house, and in the last week two other families in the neighborhood have been attacked, resulting in one death thus far, and two more children are now ill with the disease and not expected to live. I have understood moreover, that a case has occurred in another family south of this place. No restraint is put upon the families affected, but they visit their neighbors, and go to public gatherings, and it is feared that the disease will continue to spread. The County Commissioners, *ex-officio* the County Board of Health, have directed the local Health officer to take all necessary precautions, but think it would be well for you to visit the locality and see that every thing possible is done to prevent the further spread of the disease,

Yours respectfully,

W. D. SCARBOROUGH.

SECRETARY'S OFFICE,
STATE BOARD OF HEALTH,
BALTIMORE, MD., August 27, 1890.

DR. W. D. SCARBOROUGH, *Prospect, Md.*

DEAR DOCTOR—Your favor of the 26th inst. is just received. It will be quite impossible for me to get to your place before the latter part of next week, as I am booked for Cumberland, Lonaconing, and other places in Western Maryland, the latter part of this week, and will not be able to return for some days.

I have been in constant communication with your local health officer, and with Dr. Pue, who attended Mr. Thomas' children, and have been following up the circumstances of the removal of the body of the child from Wilmington ever since my attention was drawn to the fatality in Mr. Thomas' family, but I have not been able to get any very satisfactory information, and there is no law by which we can reach the guilty parties, even should we be able to fix the responsibility. It strikes me, however, if the information I have gotten is correct, that the railroad company did not exercise proper diligence in the matter of transporting the body. The corpse, under any circumstances, should have been thoroughly disinfected and enclosed in a metallic coffin. On the other hand, the trouble seems to have been the result mainly of imprudence in opening the casket after it reached its destination.

I have had a correspondence with the railroad officials on the subject, and they enclosed a copy of certificate furnished by the Health Department of

Wilmington, which states that the child died of pneumonia, upon which they received and transported the corpse.

I enclose you by same mail with this, copy of "Health Code for Towns and Villages," recently established by this Board, and approved by Attorney General Whyte, as in strict conformity with the powers of the Board; and also a circular on diphtheria from the press to-day. Your Board, under these rules and regulations, has ample power to deal with the disease, and the circular will indicate what course of action should be taken. I regret very much that circumstances will prevent me, at present, from paying a personal visit to the locality; but I shall do so as soon as practicable, should you think, after reading the rules and circular, that my presence is still to be desired. Please let me hear from you immediately on receipt of this, in order that I may be prepared to act immediately on my return from Western Maryland.

Yours truly,

C. W. CHANCELLOR, M. D.,
Secretary State Board of Health.

SECRETARY'S OFFICE,
STATE BOARD OF HEALTH,
BALTIMORE, MD., August 27, 1890.

DR. I. C. BUTLER,
County Health Officer, Belair, Md.:

DEAR SIR—I am in receipt of a letter from Dr. W. D. Scarborough, of Prospect, Md., one of your County Commissioners, calling my attention to the spread of diphtheria in his neighborhood, and requesting my presence. Unfortunately, I am just about leaving for Cumberland, Lonaconing and other places in Western Maryland, where I have served notices for the abatement of nuisances, and will probably have to bring the offenders before the Court in Cumberland, as the time given to comply with notice will expire day after to-morrow, and I must be present in order to secure the enforcement of the law.

I enclose by same mail copies of "Health Code" and circular on diphtheria just issued. The one will give you full power to deal with cases of diphtheria at Prospect, and the other will indicate the course of action to be pursued. If, however, you should need my personal presence, or it should be desired by your Board, please drop me a line, and on my return I will make an appointment to meet you. Dr. Scarborough writes that the matter requires prompt attention.

Yours truly,

C. W. CHANCELLOR, M. D.,

Secretary State Board of Health.

PROSPECT, MD., Sept 1, 1890.

DR. C. W. CHANCELLOR, *Baltimore, Md.*

DEAR DOCTOR—Your very welcome and satisfactory letter of August 27 is received. In reply will say there have been no new cases of diphtheria since my last letter, that I know of, hence I hardly think it will be necessary to inconvenience yourself at this time to come up. Should there be any new cases I will advise you, I think however it would be well for you to send me a few copies of the circular on diphtheria for distribution.

Yours very respectfully,

W. D. SCARBOROUGH.

LETTER FROM DR. BUTLER, COUNTY HEALTH OFFICER.

BELAIR, September 1, 1891.

DR. C. W. CHANCELLOR,

Secretary State Board of Health.

DEAR DOCTOR—The County Board of Health asked me to write and say if there should be any more diphtheria or any further disregard of the quarantine laws they will ask you to visit the neighborhood, in which case I will write you. I learn that the quarantine has not been respected; if I can find anyone reliable to testify to Grand Jury will have the case brought to their notice. Believe me

Very respectfully,
I. C. BUTLER,
Health Officer.

THE SANITARY CONDITION OF THE STATE HOUSE AT ANNAPOLIS.

STATEMENT OF THE SECRETARY OF THE STATE BOARD OF HEALTH, AND CORRESPONDENCE IN REFERENCE THERETO.

About the middle of October I was called upon by Judge Fowler, of the Court of Appeals, who stated that the odors in the State House were intolerable, and that he and other members of the court desired that I should make an inspection of the building and report to Governor Jackson any sanitary defects that might exist. I made the examination almost immediately and wrote to the Governor on the 20th October that I had made the investigation and found the closets in the basement of the building in bad condition, with an escape of sewer gas calculated to render the building unhealthy. The presence of the gas, I stated, was particularly distinguishable in the hall of the House of Delegates and in the entrance to the library.

In concluding this letter I said: "To make a proper investigation and ascertain correctly the source of the trouble, as well as the best means of correcting it, will require the expenditure of some money, and as the State Board of Health has no fund upon which it can draw for such purpose, I have deemed it proper, in advance of the meeting of the Legislature, to call your attention to the facts, in order that such action shall be taken as in your judgment may be deemed necessary to protect the health and lives of those who occupy the building. Bad as the sanitary condition is at present, it will become infinitely worse when the Legislature assembles."

Secretary of State LeCompte wrote to me under date of October 28th, saying that Governor Jackson would like me to make the necessary examination and report to him. When this letter was received I was confined to my house with fever of a typhoid type, which came on a few days after the examination of the State House. From this illness I did not recover sufficiently to leave the house for ten or twelve days, and in the meantime Governor Jackson had placed the matter in the hands of a plumber, who reported that nothing was wrong at the State House except an escape of burning gas into the building. I was not satisfied with this simple solution of a grave question and wrote to the Secretary of State, intimating in the most positive terms my disapproval and dissatisfaction with the opinion given by the plumber.

On Monday, the 16th of November, I was well enough to leave my home and go to Annapolis for the purpose of making a second examination of the State House, which I did in a thorough manner, being assisted by Mr. David George Hoey, a distinguished ventilating and sanitary engineer, who has since died of typhoid pneumonia, and who was then employed by the Baltimore and Ohio Railroad Company in connection with the ventilation of the Belt line tunnel. We found that serious sanitary defects existed, both as to the closets and the ventilation of the building, and considering the gravity of the situation I sent a second official communication to Governor Jackson, covering certain memoranda from Mr. Hoey, which is given below with the reply of the governor.

It is a remarkable, if not significant coincidence, that a few days after my second examination of the

State House, I had a recurrence of fever with typhoid tendency, and Mr. Hoey, who was with me at the time, has since died of typhoid pneumonia.

State of Maryland,
Health Department, Secretary's Office,
Baltimore, November 21, 1891.

His Excellency, E. E. Jackson, Governor:

Dear Sir—I beg leave to present a re-statement of my opinion as to the sanitary condition of the State House, informally rendered, at the request of members of the Court of Appeals, in a letter to you dated October 20, 1891. In that letter I said: "The water closets are badly constructed and out of order." A further examination, made last Monday, the 16th inst., in connection with an expert ventilating and sanitary engineer, has not changed my mind in this respect. The closets are badly located, badly flushed and badly ventilated. It is simply barbarous to place water closets in a basement where there is no ventilation, and from which all the mephitic gases are necessarily and surely drawn up into the building. Your plumber was satisfied with finding leaky gas pipes. This is but a small part of the evil to which I have drawn your attention, and I will now reiterate what I have heretofore said to you, that, "bad as the sanitary condition of the State House is at present, it will become infinitely worse when the Legislature assembles and the closets are used by a large number of persons." These closets should be promptly attended to. If possible they should be removed from the basement, but if this cannot be done the next best thing is (*a*) to improve the flushing arrangement, so as to provide a superabundance of water; (*b*) to provide efficient and certain ventilation of the soil pipes; (*c*) to provide for efficient ventilation of the basement, in order that the contaminated air from it shall be delivered outside the building, and not directly into it, as at present. The importance of making the improvements above suggested, with the least delay possible, is emphasized by the fact that the Legislature will assemble in the building in January and remain in session for three months. To subject our lawmakers to unnecessary discomfort and peril would be not only an injustice to them, but a misfortune to the State.

The Act of Assembly, approved April 10th 1880, recites that the Secretary of the State Board of Health "shall, when required by the Governor or other State authorities, advise in regard to the location, drainage, water supply, disposal of excrement, heating and ventilation of any public institution or building belonging to the State." In view of the great desirability of taking immediate steps to improve the Sanitary condition of the State House, I, as above stated, addressed you a communication on the 20th of October in reference to the matter; but in the absence of any definite directions from you, I have decided to again call your attention to the matter, and to say that I am ready to give the time available before the meeting of the Legislature to a study of the present condition of the Capitol building, and also the plans of necessary improvements for its ventilation, &c.

The inquiry would be concerned not only with the condition and ventilation of the water-closets, but also with a fresh air supply to all the rooms requiring ventilation. This would embrace offices, committee rooms, library, executive chamber, court room and assembly rooms. All that can be done, however, at present, or before the meeting of the Legislature, would be (1) to improve the water-closets, as they now stand, by such necessary additions and appliances as have been suggested; (2) to thoroughly cleanse and air the basement; (3) to apply some improved and efficient plan of ventilation to the Assembly rooms (Senate and House of Delegates) and to the Court of Appeals and Executive Chambers.

To insure freshness of air in these apartments, I would advise an air supply equal to their cubic contents once in twenty or thirty minutes. The small per capita space in the Assembly rooms makes it necessary to put the rate of supply at about 3,000 cubic feet for each occupant per hour. The air volume which a ventilating system could be capable of supplying may be stated thus: (*a*) for Senate Chamber a minimum supply of 100,000 cubic feet per hour for 50 accupants, which includes members, officers and visitors; (*b*) for the hall of the House of Delegates, 400,000 cubic feet per hour for 200 occupants, which also includes members, officers and visitors. The larger per capita space in the Court room and Executive Chamber makes it safe to put the rate of supply in these two chambers at 1,500 cubic feet for each occupant per hour.

Such a volume of air as will be required in the Assembly room can be moved through ordinary wall flues, without mechanical assistance, only when the conditions of weather and of working are exceptionally favorable—as in very cold weather and by the use of large and short-course flues. But the system should be able to move the air demanded through the most unfavorable conditions of weather during which artificial ventilation is called for.

There are various methods for combined heating and ventilation, but reference can only be made here to one or two. The present method for *generating* heat for State House is very good and requires no change in the furnaces; but the method of *distributing* the heat is radically wrong. The heating and ventilation of the Legislative Chambers are based upon an absurd theory that the cold and warm air which is admitted separately, will mix in proper volume within the room. The idea of pumping in cold air haphazard on two sides of the chamber, and expecting it to mix volume for volume, with the warm air introduced at random on the other two sides, is simply preposterous.

It is plain that the mixing should be effected before the air enters the room—that is to say, pure warm air should be sent into the room. The inflow of cold, outside air, settling to the lower part of the room, tends to produce a chilly stratum at and just above the floor. This, in turn, makes it necessary to heat the air of the room sufficiently high to bring the temperature of the floor stratum up to the point of comfort, or a superheating of the air in the upper part of the room for the sake of comfortable warmth in the lower part. This results in a greater temperature difference between the ceiling and floor than would exist without the entrance of cold air. That is, the chilly stratum near the floor necessitates the maintaining of a higher mean temperature within the room, for the purpose of raising the floor temperature to the point of comfort than would be otherwise required. The consequence is an increased consumption of fuel over that which would be required were the temperature uniform from floor to ceiling. There are, moreover, objections to the use of outer wall apertures, such as that through which the cold air is at present supplied to the Assembly rooms in the State House. The most serious of these objections is to be found in the disturbing, interfering and fitful action of the wind, forcing in excessive volumes of under-heated air when the wind is from one direction, and forcing out warm air when in another or opposite direction. The system which is least disturbed by wind action is that of internal supply, and especially that whose motive power is independent of wind and weather.

Prof. Woodbridge, of the Massachusetts Institute of Technology, has recommended to the Commissioners on the heating and ventilating of the State House at Augusta, Maine, which is about the dimensions of the State House at Annapolis, an apparatus which consists of "a fan and engine capable of moving and distributing under slight pressure 25,000 cubic feet of air per minute, a heater capable of heating that air from 20° below to 70° above Zero, a system of iron conduits and of wall flues for the distribution of this air throughout the extension of the building, (the Library and Committee rooms) and to both assembly halls of the main building, a system of dampers for the control of the quantities and the direction of flow of the air moved, a system of direct steam heaters under automatic control for the even warming of the rooms, boilers and chimney of sufficient capacity (these are already provided at the Annapolis State House) for the required work, and a system of vent flues and channels for the discharge of vitiated air." The several parts of this system he says, must in plan be carefully proportioned to their required individual and associated duty and to the ordinary and the special requirements for which they were designed.

The estimated cost of the heating and ventilating apparatus proposed above, in the original plan, was about $4,300, not including the boilers and their settings, nor their fittings required for the halls of the Senate and House, nor the extra cost involved in the outside location of the boiler house, which latter, with the boilers and their settings, are already provided for at our State House.

In connection with the ventilation of the building I have conferred with Mr. D. G. Hoey, ventilating engigineer, of London, England, who is now engaged in furnishing plans for the ventilation of the Belt Railroad tunnel, and some of the buildings and cars of the Baltimore and Ohio Railroad. Mr. Hoey has made a careful examination of the State House, and in connection therewith has furnished the following memoranda:

"Having visited the State House at Annapolis and inspected the existing arrangements, I entirely concur in the opinion of Dr. Chancellor that the warming and ventilation system of the building is radically and seriously defective, and that so long as it is permitted to exist, the feelings of discomfort experienced by the members and officers of the Legislative Chambers, when in session, and by the Judges, officers of the Court, Advocates, &c., of the Court of Appeals, while the Court is in session, will continue. Dr. Chancellor's claim for urgency and immediate rectification is nothing more than discharging the paramount duty of a competent medical Officer of Health."

"A description," says Mr. Hoey, "of the *modus operandi* in one room is a description of all, as the system throughout is identical. We may take the Chamber of Representatives as an example, being the largest. The heating is effected by a heating apparatus in the basement of an adjoining house, and is conducted by means of pipes passing in a tunnel to the State House, and thence all around the chamber. This heating apparatus and its connections are satisfactory and effective enough, except in the manner in which the heat produced in and conducted from the boiler house is pitched into the chamber through a few narrow, contracted orifices, thus concentrating it on the points where these orifices occur, the occupants being meantime stewed and frizzled, whilst air from the outside, wholly untempered, cold and raw, is forced into the chamber by a rotary fan, driven by a gas engine, through four contracted openings in the hall. By the concentration of this cold rush, at the points where these few openings occur, the occupants there are subjected to dangerous draughts and chills.

"The plan of forcing air into an apartment by means of a rotary fan is founded on a fallacy, which has already been exploded where it originated. As every interior on the earth's surface contains its entire fill of air, which can neither be increased nor diminished, all that is required is to remove the impure air, which floats on the top, and the fresh air will come in of itself. If the impure air is not regularly drawn off, the forcing in of the outer air, only produces an agitation of the entire internal atmosphere, and a churning up of fresh and foul air together, a portion of the mixture escaping by the easiest available channels, while the remaining air continues loaded with impurities.

"The plan which I propose by my new system embraces the complete ventilation of the Chambers of Legislation (the Senate and House) the Supreme Court and the Executive Chamber over the Senate. These are the most important and most urgently in need of purification.

"The method of introducing heat into the chamber will be readjusted and the mode of putting to use the hot water pipes will be wholly rearranged. Hot water batteries or coils will be put into connection with the hot pipes which circulate all around, and are fitted into the window spaces in the two assembly Chambers as they already exist above in the Court Room. All these spaces will be formed on my method of arranging air reservoirs, by which the rooms will receive an abundant and unintermittent supply of fresh air, wholly free from draughts or felt currents, tempered to the desired extent by passing over the heating coils or batteries before entering. The gas engine and fan will be discarded, and all the irregular entrances for air will he closed up.

"The vertical shafts for taking off the impure air will be entirely rearranged, above and below, and smoothly finished inside; the entrance into them from the rooms will be opened up, enlarged and finished in the lower chambers and entirely readjusted in the upper chambers. The existing coverings on the top will be removed and others erected, such as will promote the free, full and unintermittent discharge upwards of the whole vitiated air, with all appliances necessary for securing perfect and efficient ventilation. To maintain the style of architecture, the new coverings will be encased in belfries corresponding with the great tower.

"The cost, including the refinements for the maintenance of due taste and appropriate finish, in keeping with the style of the building, will not exceed $3,500.

"I send in these notes just as I am about leaving with President Mayer of the Baltimore and Ohio Railroad, on a tour of inspection over the lines of his road, which will probably occupy about ten days. If upon my return, I should receive instructions to proceed, I would remain in this country until the 1st of January 1892, with the view of having the ventilation in operation by the time the Legislature meets, although the turrets and other work, not essential to the practical result, might remain to be finished later on.

"Terms would be one-third on the men being put on the job with the necessary material, one-third on the ventilation being put into operation, and the remaining third when all is completed."

D. G. HOEY, *Ventilating Engineer,*
Temple Chambers, London, E. C.

The above is transmitted for your consideration. I have no personal knowledge of the Hoey system, but President Mayer of the Baltimore and Ohio Railroad will, I understand, furnish all necessary testimonials.

Very respectfully.
C. W. CHANCELLOR, M. D.
Secretary State Board of Health.

OFFICE OF THE SECRETARY OF STATE,
ANNAPOLIS, MD., Dec. 4, 1891.

DR. C. W. CHANCELLOR,
Secretary of State Board of Health.

DEAR SIR: Governor Jackson has requested me to acknowledge the receipt of your report, dated November 21st, last, upon the sanitary condition of the State House.

The Governor further requests me to say that he has read your report carefully, and while he agrees with you that the ventilation of some parts of the building is defective, the plan you propose to overcome the supposed difficulty is so very elaborate, and will cost such a large amount of money, besides which it is impossible to have it completed before the assembling of the Legislature, that he cannot see how it can be attempted by him, in addition to which there is not a dollar at his disposal for such purpose.

He has referred your report and all the papers in the case to the Attorney General for his opinion.

Very respectfully, &c.,

E. W. LeCOMPTE,
Secretary of State.

A NUISANCE AT LONACONING.

Maryland State Board of Health,
Secretary's Office,
Baltimore, Md., December 16, 1891.

Hon. R. M. Boyd, *Mayor of Lonaconing, Md.*

Dear Sir: The correspondent of the State Board of Health in Allegany County informs me that the most unsanitary conditions prevail in and about the slaughter houses in the town of Lonaconing, notwithstanding the fact that the butchers were duly notified by this Board, August 12th, 1890, when I made a personal inspection of the various premises, not to deposit any of the refuse or offal of the slaughter houses in George's Creek, to be washed down into the Cumberland water supply, or to decompose and poison the air of the town.

If the Butchers have so far disregarded the law of the State, Chapter 6, Act of 1886, and the orders of the State Board of Health, relating thereto, it is due to the community that they should be punished by a vigorous enforcement of the provisions of said Law, and

I respectfully appeal to you, as the Chief Executive of the Corporation, to aid the State Board in protecting the health and lives, not only of your own people, but of others lower down the river, who are forced to use the water, recklessly, if not criminally, polluted by the butchers of Lonaconing. I shall bring the matter at once to the attention of the State's Attorney of the County and invoke his aid in enforcing the law, but in the meantime I trust the local authorities will add the force of their authority in correcting the evils complained of. Every slaughter house and pig-pen should be banished beyond the corporate limits, and especially should they be removed from the line of George's Creek, since it is apparent that the only object in erecting them along the banks of the creek is to secure water for washing the meat, *which is not fit for such purpose*, or to afford a ready dumping place for the filth and offal that it may be carried off by natural flow or flood water into the Potomac River, and thence into the pipes of the water supply of Cumberland.

If you have no local law that will reach the cases in point, the law established under the Rules and Regulations of the State Board of Health, a copy of which I send you by same mail with this, can be applied, and the Board will render you prompt assistance in the matter. It is, of course, very desirable, that local troubles should be corrected by local authorities, and this Board would greatly prefer that such should be the case in this instance; but it must be remembered that the nuisance complained of affects other communities than that in which it is created, and, therefore, it is proper that I should, in addition to calling your attention to the matter, also ask the aid of the State's Attorney in promptly abating the nuisance.

Very respectfully,

C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

APPROPRIATIONS AND EXPENDITURES.

APPROPRIATIONS.

For expenses of Board, 1890	$1,200 00
" " " 1891	1,200 00
	$2,400 00

EXPENDITURES.

For traveling and other expenses of Board for two years ending September 30th, 1891, including printing and distributing of circulars and reports, as per vouchers filed	$2,342 32
Balance	$57 68

PART V.

THE LIFE HISTORY OF THE STATE AND SPECIAL DISEASES.

It was provided by the Act of 1890, Chapter 622. "That whenever any physician or person acting as a physician shall know or shall have cause to believe that any person whom he has attended during the last illness of such person in this State, outside the limits of the City of Baltimore, has died of small-pox, cholera, yellow fever, typhoid or typhus fever, diphtheria, leprosy, or any other disease of a contagious, infectious, or epidemic character, the said physician or person acting as a physician shall, over his own signature, immediately give notice thereof to the Secretary of the State Board of Health, which notice shall state the cause of the death, the name, age, sex and color of the deceased, and such other information in connection with the existence and spread of the disease as may be deemed important for the protection of the public health. And if no physician has been in attendance during the last illness, or at the time of the death of such person, then it shall be the duty of the householder in whose house or upon whose premises the death occurred, to transmit to the Secretary of the State Board of Health the facts in accordance with the requirements of this Section."

Even by this simple method of collecting a record of deaths from contagious or infectious diseases, great difficulty exists in obtaining accurate statistics from the physicians. Often the returns are not furnished at all, and in other instances not until after repeated applications, and even then they are forwarded in many instances, so manifestly incorrect. that it is necessary to send them back for correction, frequently more than once. It is surprising that a matter which must be of interest to every physician should not receive more attention at their hands.

The value of a full and correct record of vital statistics is recognized in all European countries, and is coming to be more extensively demanded in this country. European nations are so careful in this regard, that they keep a record of their citizens even when they are absent from their homes, and request the vital statisticians of all foreign countries to certify to the death of any of their citizens that may occur in their respective countries. It is not uncommon for health officers in this country to receive communications from foreign governments requesting such certicates. Such records fulfil many useful purposes. They serve to facilitate the identification of individuals for the transmission of property, and for the protection of life against crime.

It is plain that if registration of deaths were properly provided for and efficiently conducted, the State Board of Health would be promptly informed of the prevalence of preventable diseases, and be thus enabled to take the necessary measures for the protection of the public health with the least possible delay. It would likewise show the degree of salubrity of different localities; mark the progress from year to year; keep always in view the vital condition of the people in the State; and in many other respects furnish instruction of great general importance, not only to the statistician, but to the statesman. Moreover, "registration reports, taken in connection with the census, yield statistical results which throw light upon the casual conditions under which prevailing diseases occur, and thereby becomes the source of invaluable contributions to the science of preventable medicine."*

It has been held by high authority that in countries in which the climate is healthy, hygiene properly attended to, and the population in a normal condition as regards age, the ordinary mortality incident to human nature would probably cause the death rate to be in the proportion of 12 per 1000 persons living. It should, however, be borne in mind that the death rates based merely upon the total population, in common with birth and marriage rates calculated upon a like basis, are not always fair tests of the state of a community. If the proportion of very young or old people is high, the death rate will be also high; but if, on the other hand, the number of persons at the middle age is excessive, the death rate will be low.

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* Buck's Hygiene and Public Health.

In most European countries of which the information is at hand, the mean annual death rates are higher than in the State of Maryland, so far as we can judge by the census returns of the two past decades, which give an average of about 16.3 per thousand of living population. In the following table, the counties are arranged in the order of their mean death rates, as shown in the last column:

DEATH RATES IN EUROPEAN COUNTRIES, 1883 TO 1887.

COUNTRIES.	NUMBER OF DEATHS PER 1,000 OF MEAN POPULATION.					
	1883.	1884.	1885.	1886.	1887.	Mean of 5 years.
Hungary	36.6	31.4	....	32.2	....	32.1*
Austria	30.1	29.2	29.9	29.4	28.9	29.5
Italy	27.5	26.7	26.6	28.3	27.7	27.4
German Empire	25.9	26.0	25.7	26.2	24.2	25.6
Spain	33.1	31.1	....	....	....	32.1†
Prussia	25.3	25.5	25.7	26.0	23.9	25.3
France	22.2	22.2	22.0	22.5	22.0	22.2
The Netherlands	21.8	22.2	21.0	21.8	19.7	21.3
Switzerland	20.3	20.1	21.1	20.4	....	20.5‡
Belgium	20.8	20.9	20.1	21.1	19.3	20.4
England & Wales	19.5	19.6	19.9	19.3	18.8	19.2
Scotland	20.1	19.4	19.1	18.6	18.7	19.2
Denmark	18.4	18.4	17.9	18.2	18.3	18.3
Ireland	19.2	17.6	18.4	17.9	18.3	18.3
Sweden	17.3	17.5	17.8	16.6	...	17.3‡
Norway	17.1	16.4	16.5	16.1	....	16.5‡

* Mean of three years. † Mean of two years. ‡ Mean of four years.

According to the reports of the Registrars-General of England and Scotland, the death rate of the latter country approximates very closely to that of the former, but in Ireland it is considerably lower than in the other two countries.* The figures for the United Kingdom during each of the seventeen years ended with 1887 were as follow:

DEATH RATE IN THE UNITED KINGDOM, 1871 TO 1887.

	Deaths per 1,000 of the Population.
1871	22.6
1872	20.9
1873	20.8
1874	21.6
1875	21.2
1876	20.5
1877	20.0
1878	21.2
1879	20.5
1880	20.4
1881	18.7
1882	19.2
1883	19.5
1884	19.3
1885	18.9
1886	19.0
1887	18.7
Mean	20.2

In every country the death rate is higher in towns than it is in the extra-urban districts. This circumstance, although no doubt partly attributable to the superior healthfulness and immunity from contagion prevailing in the latter, is also to a great extent due to the fact that hospitals and charitable institutions, which are frequented by patients from the country as well as town residents, are generally situated in towns; and further, that outside of charitable institutions many persons die who have come from the country on the approach of serious illness for the sake of the superior nursing and medical attendance to be obtained in the city.

PREVALENT DISEASES.

The year 1890 and 1891 has been marked by an increase in the mortality from typhoid fever and diphtheria, but a diminished mortality from measles, whooping cough, scarlet fever, and dysentery. Taken as a whole, these diseases have caused fewer deaths than in any preceding two years of which we have any record.

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* Formerly the registrations in Ireland were admitted to be defective; but the Registrar-General of that country states that in recent years much improvement has taken place—especially since the passage of certain Acts of Parliament in the years 1878–80, and he has reason to believe that at the present time but few deaths escape registration.

In consequence of the very serious and fatal prevalence of typhoid fever in several localities the following is published for the information of Local Boards of Health and the public generally:

CIRCULAR ON TYPHOID FEVER.

1. The Rules and Regulations of the 1st of August, 1890, established by the State Board of Health, under the provisions of the act of 1890, chapter 622, and which apply immediately on the occurrence of typhoid fever or any other disease, require local boards of health, or inspectors, to have removed frequently and regularly all refuse matters, and to keep clean all drains, channels, cesspits, cesspools, &c. With very few exceptions, no special action is known to have been taken, although such action was in many instances manifestly necessary.

2. Whenever typhoid fever occurs all accumulations of night soil, manure, garbage, filth, or other noxious or offensive matter, ought to be removed immediately, and all drains on the infected premises should be properly cleansed, once at least in every twenty-four hours, and flushed with a solution of chloride of lime or sulphate of iron (common copperas). Offensive deposits causing a nuisance ought to be promptly removed by the town authorities, and efforts made to detect and punish the offenders.

3. Whenever there is accumulation or soakage of house refuse, or decaying animal or vegetable matter, the nuisance should be abated as speedily as possible, and care taken not to let it recur. Examinations should be made constantly as to the efficient working of sewers and drains, and any defect therein, or any

nuisance arising therefrom, or from foul ditches, or accumulations of water, whether under houses or otherwise, should be got rid of without delay. Disinfectants should be liberally used over all exposed surfaces from which filth has been removed.

4. Sources of water supply should be well and constantly examined, and water which can in any way be tainted by animal or vegetable refuse, especially where there is a possibility of leakage or filtration from sewers, drains, cesspools, or foul ditches, should never be drunk. If, unfortunately, the only water which for a time can be got is open to suspicion, it ought to be boiled. Filtering of the ordinary kind cannot be trusted to purify water. The imminent danger of allowing any sewage or offensive matter to find its way into any reservoir or other water supply seems sufficiently obvious. The greatest care should be taken when washing the bed or body linen of typhoid patients that no water thus used should find its way into any water supply used for domestic purposes.

5. Where there is any possible relation between the distribution of disease and milk supplies, the purity of the water used in dairies, the health of the cows and of the persons engaged in the trade should be the subject of frequent inspection. Disease can be conveyed by washing dairy cans in impure water. Milk should be boiled immediately on its reception into a house. This custom is common in the Continental countries of Europe.

6. The majority of wells in towns, villages and farm houses, are in a notoriously dangerous condition; infected more or less through negligence, or owing to filtrations, they are a constant menace to the public health. It is advisable, therefore, that wherever there is an outbreak of typhoid fever in families using well water, that special means be adopted to purify the water of such wells as have become centres of infec-

tious disease. This may be accomplished (1) by throwing into the suspected well from 10 to 15 pounds of chloride of lime, according to the size of the well, and the depth of water in it; (2) when such disinfection has taken place, and within four or five days thereafter, the well must be completely cleaned, and then within two or three days thereafter disinfected anew, by the aforesaid means, viz., by throwing into it 10 or 15 pounds of chloride of lime, and subsequently, after three days, pumping out all the water and allowing the well to fill with clean water; after which, in most instances, the water may be used with impunity. Should the water of a well remain in a bad state after having been treated in the manner prescribed, the well must be absolutely closed or filled with earth.

7. Typhoid fever does not confine its ravages to poor and crowded neighborhoods, nor have such localities a monopoly of dirt. The yards, cellars and back premises of many well-built and handsome houses are sometimes (through carelessness of servants and otherwise, in a very offensive and neglected state, and but little attention seems to be paid to such places by local inspectors. The more influential and wealthy the party offending, the better example it is to prosecute. If strong and persistent efforts were made by local authorities and by the public generally, beneficial results would immediately follow, and the horrible scourge of typhoid fever would gradually disappear.

8. Where disinfection of places and premises is deemed necessary, chloride of lime will be found effective and reliable. It must be of good quality, containing about 30 per cent. of available chlorine, four ounces or eight ounces of which, well mixed with one gallon of water, is a proper strength to use. The dejections or secretions from a patient suffering from any zymotic disease should be treated with a solution of—

Corrosive Sublimate, ¼ oz.
Permanganate of Potash, 1 oz.
Water, 1 gallon.

To be used for covering all fæcal and other discharges, which must be left in contact four or six hours, and then buried deep in the earth, remote from any water supply, or burned. It must not be forgotten that corrosive sublimate is a deadly poison.

DEATHS FROM TYPHOID AND TYPHUS FEVERS.

In the returns of most European countries deaths from typhoid fever are not distinguished from those caused by typhus, the latter being a complaint which does not exist to any extent in the United States. In England and Wales these fevers have been returned separately since 1869, and it is probable the following figures, so far as they relate to that country, apply to typhoid only, whilst those for most of the other countries, it is believed, refer to the two descriptions of fever combined.

ANNUAL DEATH RATE FROM TYPHOID IN VARIOUS COUNTRIES, FROM 1881 TO 1884.

	Per 10,000 Persons Living.
Italy	9.37
Spain (towns)	8.35
Austria	7.31
Belgium	6.17
Spain	5.63
Massachusetts	5.30
Prussia	5.14
Belgium (principal towns)	4.69
Austria (15 towns)	4.49
Switzerland (17 towns)	4.31
Holland	4.24
Sweden (principal towns)	3.95
Denmark (towns)	3.85
Scotland	3.77
Scotland (8 towns)	3.62
Ireland	3.57
Germany (principal towns)	3.56
Sweden	2.87
England and Wales	2.70
Switzerland	2.30
Russia and Europe	2.07
Maryland for the census year of 1880	7.66

DEATHS FROM SCARLET FEVER.

The mortality from this disease has very much diminished of late years, which is to be attributed to improved sanitation and the observance of precautionary measures. The following circular will be found useful in the absence of medical aid:

SCARLET FEVER.

Ordinary Symptoms.—More or less feverishness, with vomiting and headache, also soreness of the throat; which, on examination inside, will be found of a deep red color. As the disease advances there is much swelling about the tonsils. The rash generally commences about the face, neck and chest, but sometimes on other parts of the body. It is usually of a scarlet color, but occasionally purplish or dusky, and the skin very hot.

Infection.—Scarlet fever is highly infectious and contagious. A healthy person may carry the germs, and clothes or papers which have been in a sick room will convey the infection to a distance, and may communicate the disease months afterwards when unpacked. The infection begins at the commencement of the sickness, and lasts for several weeks or even months. It is greatest at the height of the disease. The period of incubation (that is, the interval between infection and the first sign of illness) is from about three to five days, and the rash usually appears on the second day of sickness. When scarlet fever gains entrance to a healthy house it need not spread. Prompt isolation, or removal of the susceptible is generally successful, and as the rash is an early symptom. it soon attracts attention.

Treatment.—When there is nausea or the tongue is much coated, some authorities recommend an emetic. The best is a teaspoonful of ipecacuanha wine in tepid water every ten minutes until free vomiting comes on. Give plenty of tepid water as drink to aid the emetic. This is intended simply to relieve the stomach or *primæ viæ* of undigested matter. Keep the room well ventilated; doors and fire-places open: and if necessary, the windows may be kept partially open, taking care to prevent draughts coming directly on the patient. The great risk of getting cold is when the skin begins to peel off. In all cases—even the mildest—the patient should be kept in a comfortably warm, but well ventilated room, at a temperature of from 68° to 70° Fahr., two or three weeks, and when allowed to go out the clothing should be warm. To prevent dropsy, which frequently occurs in connection with scarlet fever, the patient should avoid exposure to cold or damp for some weeks after recovery.

Prevention.—To prevent scarlet fever give belladonna in small doses—say three grains of the extract to two or three teaspoons of water, and give of this daily twice as many drops as there are years in the patient's age.

Diet, Bathing, etc.—The diet should be light and spare at first, plenty of liquids, little at a time, and frequently. Plain water, milk, or barley water drinks may be taken cold, or even iced. When more nourishment can be taken, chicken broth, beef tea, or mutton broth is suitable. Eggs lightly cooked, if the patient can digest them, will be useful. To relieve the hot skin the whole body should be sponged over with tepid water two or three times in the twenty-four hours. If the patient is clearly able to bear it, a tepid bath once or twice a day may be given, or as often as the temperature rises above 100° Fahr. Keeping the temperature of the body down to or below 100° is the sheet anchor in the disease, and there need be no fear of the bath for this purpose. After the sponging or bath, when the skin has been dried, the whole surface may be rubbed over with oil, lard, vasseline or cold cream. This is very cooling and agreeable, and may be repeated as often as convenient. The throat requires special attention. When there is much swelling ice is very useful. Young children can take it as iced water, in teaspoonfuls given frequently.

DIPHTHERIA.

With the exception of a very serious and fatal outbreak of diphtheria at Prospect, Harford County, in the fall of 1890, noted in the quarterly report for the quarter ending September 30th, 1890, the mortality from this disease has been below the average in this State, until within the last three months, during which time numerous outbreaks have occurred. This outbreak at Prospect was occasioned by the removal of the body of a child dead of diphtheria, from Wilmington, Del., to Prospect, and subsequently opening the coffin for the inspection of the corpse. (See report above referred to.)

Diphtheria is a dangerous contagious disease, and to prevent or restrict it the special contagion should be avoided. Beware of crowded assemblies in ill ventilated rooms; keep the grounds under and around your house well drained; do not allow any animal or vegetable matter to decompose on the surface of the ground near your house; avoid the neighborhood of soap factories, slaughter houses, rendering establishments and other sources of foul odors; keep your privy thoroughly clean, and disinfect it frequently with strong copperas water; keep your house, and especially your sleeping rooms, well ventilated, your cellar dry and clear of all decomposing vegetable or other substances; do not allow any cesspool near your house; look to your house drains with scrupulous care; see that they are well trapped, kept clean and ventilated into the open air, so as not to permit the entrance of sewer gas into your house; be sure that your drinking water is not contaminated by surface drainage, nor by leakage from a drain, sewer, cesspool, or vault.

Every person known to be sick with diphtheria should be promptly and effectually isolated from the public; one or two persons only should take charge of the patient. Keep the room in which one is sick well ventilated, and cleared of all needless clothing, carpets and other materials likely to harbor the poison of the disease. The discharges from the throat, nose and mouth, are extremely liable to communicate the disease, and should be received on soft rags or pieces of cloth, which should be immediately burned. The discharges from the bowels and kidneys are also dangerous, and should be received into vessels kept thoroughly disinfected with a strong solution of copperas, chloride of lime, carbolic acid, or preferably a mixture of corrosive sublimate and per manganate of potash, one quarter grain of the former and one grain of the latter to one gallon water, and then buried at least one hundred feet from any well, spring or other water supply. Soiled bed and body linen should at once be placed in boiling water. No person recovering from diphtheria or scarlet fever should be permitted to attend school, church, or any public assembly. No children, and in most cases few adults, should attend a funeral at a house in which there is a case of diphtheria or scarlet fever, or in which a death from either disease has recently occurred. The room in which there has been a case of diphtheria or scarlet fever, whether fatal or not, should, with all its contents, be thoroughly disinfected by exposure for several hours to strong fumes of burning sulphur, and for several days to currents of fresh air. After death or recovery, the clothing, bedding, carpets, mats and other cloths, which have been exposed to the contagion of the disease, should be either burned, exposed to superheated steam, or be thoroughly boiled.

The body of a person who has died of diphtheria should be washed with a zinc solution, made in the proportions as follows: water one gallon; sulphate of zinc eight ounces, common salt four ounces; then wrapped in a sheet wet with the zinc solution, and at once be buried. In no case should the body be exposed to view.

No public funeral should be held at a house in which there is a case of diphtheria, nor in which a death from diphtheria has recently occurred. Except under extraordinary precautions there should be no public funeral of a person who has died from diphtheria. No child should attend. and it would be better in most cases that few adults should attend a funeral of a person dead of diphtheria.

In consequence of the similarity of complaints and the number of deaths set down to a combination of both, it is misleading to consider the deaths caused by diphtheria apart from those caused by croup. Taking the two affections together, we may estimate that there are to every 10,000 of the population of Maryland in the proportion of about 7.05 deaths from these diseases annually. The proportion was, of course, much higher from 1882 to 1884 inclusive, or during the severe and fatal epidemic of diphtheria in Frederick City; but in previous and subsequent years the mortality has been less than that of many of the following countries:

ANNUAL DEATH RATE FROM DIPHTHERIA AND CROUP IN VARIOUS COUNTRIES, 1881 TO 1884.

	Deaths from Diphtheria and Croup per 10,000 persons living.		Deaths from Diphtheria and Croup per 10,000 persons living.
Austria	16.63	S. Australia (1878 to 1887)	5.93
Prussia	15.45	Scotland (eight towns)	4.99
Spain (principal towns)	11 83	Victoria (1878 to 1887).	4.16
Germany (principal towns)	11.54	Queensland (1878 to 1887)	4.75
Massachusetts	11.13	N. S. Wales “ “	4 77
Austria (principal towns)	10.36	Russia in Europe	4 67
Sweden	9.79	Scotland	4.55
Sweden (principal towns)	9.74	Tasmania (1878 to 1887)	4.46
Italy	9 18	Belgium (principal towns)	3.79
Switzerland (principal towns)	8.49	Holland	3.76
Belgium	7.72	England and Wales.	3.05
Spain	6.85	Ireland	2.70
Denmark (towns)	6.28	New Zealand (1878 to 1887)	2.42
Switzerland	6.09		

LA GRIPPE.

The effects of an atmospheric poison on the functions of the nervous system were never more strikingly displayed than in the epidemic of "grippe" which has prevailed more or less extensively throughout the world since 1889, and with peculiar fatality in this State during the present winter of 1891–1892. The death-roll in Baltimore has been a long and startling one, embracing all ages from childhood to old age, but principally confined to the latter, and to persons already enfeebled by other diseases.

The disease affects primarily the nervous system, and is at times as sudden and violent in its manifestation as a moderately poisonous dose of prussic acid would be if taken into the stomach. The contention that it is identical with or nearly related to "influenza" is about as rational as it would be to describe Asiatic cholera as a congener of ordinary diarrhœa. The so-called "cold" attending the disease is simply a manifestation of a *symptom*, as diarrhœa is a symptom of cholera. It is altogether probable that its great prevalence is due to some depressing influence or atmospheric poison, rather than to a specific germ, which poison tends to depress the nervous system, and renders the patient susceptible to "cold" and its possible consequences—pneumonia.

In Scotland, in 1877, of the total numbers of deaths, 9182, from Grippe, then known as "bronchitis," no fewer than two-thirds occurred in delicate children, under five years of age, or very old persons, and, apart from its fatal effects at the time, it was found that the disease was liable to recur from time to time, and finally became chronic, leading to changes affecting both lungs and the heart, which occasioned prolonged ill health and ultimately terminated life. Again, in addition to its depressing effects upon the nervous system, the disease has been found to attack the lungs themselves primarily, and produce inflammation, or acute pneumonia, to which the patient, if old or enfeebled is almost certain to succumb, on account of the great nervous prostration. On the other hand, if uncomplicated, and in a previously healthy and vigorous person, the disease usually runs a favorable course.

As to the best means of preventing the disease, there does not seem to be any reliable prophylactic; but as it evinces a manifest tendency to attack the lungs secondarily, it is always well to adopt such measures as will ward off the full effect of the action of cold upon these organs. It must be remembered, moreover, that the brain and the heart are sometimes attacked, secondarily, and, therefore, caution should be exercised in the administration of stimulants and tonics which would seem to be indicated as an offset to the prostration attending almost every case of the disease. For the same reason quinine should be used with caution. Arterial sedatives are for the most part valuable in the treatment of the disease, notwithstanding the depressing effects of the poison.

No doubt the action of the will may have a great deal to do in keeping off the enemy. The statement made in the *London Lancet* some years ago, (November 29, 1879,) that "the man who resolves not to take a cold seldom does," is peculiarly applicable to grippe, for not only can one brace himself up to exert a strong mental resistance when he feels himself threatened by nervous depression, but he almost instinctively resorts to some physical means to prevent it, and this, if he is in health, will generally succeed. Some of us may remember the graphic description of Cowper, in the "Task," of the countryman driving home his team in a stormy winter evening:

> "He, formed to bear
> The pelting brunt of the tempestuous night,
> With half-shut eyes, and puckered cheeks, and teeth
> Presented bare against the storm, plods on."

Unhappily, however we are not all made of such stout material, and in our modern way of living any of us, even the strongest, may catch cold, whether we resolve or no. Indeed, it would seem that many of our "colds" come upon us by stealth, and we are often unable to say how we have contracted them. We may, however, summarize the points in the following propositions:

1. That our bodily health depends not on clothing or anything external to us, but upon active changes going on within us in the processes of nutrition.

2. That during life the heat generation is always going on, while at the same time there is a giving off of heat from our bodies, chiefly by the lungs and skin, and that the due adjustment of this heat production and heat discharge maintains the body at its normal standard of temperature, 98° to 99° F., irrespective of that of the surrounding air.

3. That extreme cold, by removing our bodily heat, tends to exercise a depressing effect upon the nervous system, but that in health this effect is resisted up to a certain point by the protection afforded by clothing, but more especially by the defensive and reacting power of the skin.

4. That when this defence is broken down, either by too prolonged exposure. ill health, want of food, insufficient clothing, bad air, etc., a morbid impression is made upon our nerves and brain, which is conveyed from thence to some part or organ of the body and produces an alteration in nutrition, which finds expression in the form of inflammation, either slight, as in the case of simple catarrh, or of more grave and serious character, as in *la grippe*.

SMALL-POX AND VACCINATION.

By the law of Maryland as it now stands, every parent must have his child vaccinated within six calendar months of its birth, and the vaccination should be repeated until it is successful, unless the child is found to be insusceptible. Teachers in any school (private or public) are forbidden to receive into such school any person as a scholar until such person shall produce the certificate of some regular practicing physician that such applicant for admission has been duly (properly) vaccinated. The penalty for violation of the law is ten dollars for each offence.

In spite of the law, and the incalculable blessings which have been conferred by vaccination, it has been found on inspection of the children, attending school in some of our towns, ranging in age between five and seventeen years, that more than fifty per cent. of them have never been vaccinated, (see special report on the schools of Cumberland) should small-pox unfortunately break out in one of these schools its ravages would be terrible indeed. Various fevers and other diseases are produced by overcrowding, bad drainage, and other general causes, but small-pox never seems to be produced in this way; it is only propagated by contagion. All we know of its history shows that it has always been imported or carried from place to place, by those who are affected with or who have been subjected to the contagium of the disease. Such being the fact it is very important that every community should be prepared at all times to resist the introduction of this loathsome disease, which can be done by systematic and proper vaccination, for in spite of all that has been said by its opponents, no unprejudiced person can doubt as to the efficacy and value of vaccination. In countries where it has been introduced and systematically carried out, the number, the intensity, and the extent of smallpox epidemics have been remarkably diminished, and in a manner which makes the idea of mere coincidence utterly inadmissible. Several facts may be cited in illustration of this.

In London alone, during the eighteenth century, the annual mortality from small-pox was 3,000 to 4,000. In the ten years after vaccination was introduced and generally practiced, viz., between 1845 and 1854, when the population was enormously increased, the average annual mortality was about 340, and if vaccination had been properly attended to, as is the case on the Continent, it would have been even smaller. The following table will show that in the European countries where vaccination is compulsory the pestilence is almost wholly extinct:

		1887.	1888.
Austria—Hungaria,	Vaccination Optional,	583.7	540.4
Russia,		535.9	231.5
France,		167.0	191.9
German Empire,	Vaccination Compulsory,	1.8	0.8
Denmark,		0.0	0.0
Sweden and Norway,		0.0	0.0

The above table shows the number of deaths in each 1,000,000 of inhabitants. It should be mentioned here that it was not until 1853 that vaccination was made compulsory in England, and not until 1864 that this provision was extended to Scotland.

A prime object of the compulsory law in this State is to make sure that children, especially those in attendance at any school, are properly protected against small-pox, to the end that their health and lives may be preserved, and interruptions to the schools by the disease may be avoided. The words "duly vaccinated" in the law undoubtedly imply that in addition to the name, residence, age, date of vaccination, etc., the certificate shall accurately state the *result*, as shown on the child's person, which the physician should testify to of his own knowledge, and not from information or belief. In case of failure in a vaccination, the attempt should be repeated often enough (at least five times at intervals of a fortnight) to demonstrate the insusceptibility of the child, and re-vaccination should be insisted on where the scar is "bad," that is less than one-fourth of an inch in diameter, or simply a smooth, flat, shiny mark, or where the child has not been vaccinated successfully within seven years.

The execution of this law necessarily devolves upon the various officers of public institutions—county superintendents, school directors, trustees and teachers—each and all of whom are responsible for its enforcement in their respective capacities. In all cases, however, the assistance and co-operation of the local health authorities should be invited.

The frequent irritation growing out of the legal requirement that teachers should not receive pupils into their schools who have not been duly vaccinated, and the singular construction given the law by some of the physicians, led to the following correspondence between E. F. Perkins, Esq., Examiner of Public Schools for Kent County, and the Secretary of the State Board of Health:

MR. PERKINS' LETTER.

DR. C. W. CHANCELLOR,
Secretary State Board of Health.

DEAR SIR—The law of the State says, "No teacher in any school shall receive into such school any person, as a scholar, until such person shall produce the certificate of some regular practising physician that such applicant for admission into the school has been *duly* vaccinated."

It is a very general practice with the physicians of this county (not with all) to insert vaccine virus in the arm of a child and immediately certify that it has been vaccinated.

The common sense of our teachers rebels often against this construction of the law, and it leads to frequent unpleasantness between the teacher, who does not wish to incur the penalty of the law, and parents.

I am not advised how far the State Board of Health has authority to enforce or construe the State Laws of Health, but I desire your opinion, whether a physican can, upon the simple insertion of vaccine virus, comply with the spirit and intention of the law, and certify that the person has been *duly* vaccinated.

If the law, which makes it the duty of every parent and guardian to have his child vaccinated within twelve months after its birth, was enforced, the school authorities would be relieved from many conflicts.

I write in behalf of the teachers, who are constantly pressed by those who, neglecting to have their children vaccinated in proper time, place the teacher in an unpleasant and responsible position.

Very respectfully yours,
EBEN F. PERKINS,
Ex. Public Schools, Kent County, Md.

DR. CHANCELLOR'S REPLY.

SECRETARY'S OFFICE,
STATE BOARD OF HEALTH,
BALTIMORE, Sept. 11, 1890.

E. F. PERKINS, ESQ., *Examiner of Public Schools:*

DEAR SIR—Your letter of the 10th inst., requesting my opinion as to "whether a physician can upon the simple insertion of vaccine virus (without awaiting results) comply with the spirit and intention of the law, and certify that the person has been *duly* vaccinated?" has been received and carefully considered.

Any opinion I might express on the above question would, of course, have no legal force or effect; but viewing the matter from a professional and sanitary standpoint, it is obvious that no person can be considered "duly vaccinated" until a record has been made up in the case, which record should show the date of vaccination, whether a primary or a revaccination, and whether successful or unsuccessful; unless there exist unmistakable indications of a previous vaccination, which must have been performed within a period not longer than seven years. The simple fact of inserting an atom of virus in the arm of a child is only part of the process of vaccination, and does not, in my opinion, justify the physician in certifying that the child "has been *duly* vaccinated."

Every person entering a public school should give satisfactory evidence of protection against small-pox, or be excluded until the rule be complied with. Vaccination certainly amounts to nothing without it implies protection, and, therefore, the expression "duly vaccinated" must mean, if it means anything, that the child having exhibited all the phases of phenomina of a true and successful vaccination, or having, in the event of failure in the first vaccination, been vaccinated with virus known to be pure, is duly protected. It seems to me that the power to fix a standard of vaccination inheres in the school boards, which are supposed to be the guardians of the health as well as the education of the pupils, and in this matter the State Board of Health will, I am sure, be ready and willing, at all times, to advise and co-operate.

Under the Act of 1890, chapter 622, section 6, it is provided that "the State Board of Health shall make such regulations respecting nuisances, sources of filth and causes of sickness as they shall judge necessary for the public health and safety."

Again, under the Act of 1886, chapter 22, section 1, it is provided, "that whenver the State Board of Health shall have cause to believe that there is danger of cholera, small-pox or other dangerous or infectious disease invading this State or country, it shall be the duty of the said board to take such action and adopt and enforce such rules and regulations as it may deem necessary to prevent the introduction or spread of such infectious or dangerous diseases within this State; and any person or persons, or corporation refusing or neglecting to obey such rules and regulations, shall be deemed guilty of a misdemeanor, and shall, upon conviction in a court of competent jurisdiction, be fined not less than $50 nor exceeding $500 for every such offence."

Under either of the above laws, this board will be able to render your school board whatever assistance it may require in the matter of establishing a proper standard of vaccination.

Very respectfully yours,
C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

ALCOHOLISM.

It is to be regretted that, in the absence of any law for the collection of vital statistics in this State, no data can be furnished as to the mortality from alcoholism; but it is believed that the enforcement of the prohibition laws in some of the counties has had the effect to diminish the death rate from this cause. The following table may be accepted as a very fair average of the mortality from alcoholism in the countries and towns named. It will be seen that a record from only two of our States, viz., Connecticut and Massachusets, has been obtained:

ANNUAL DEATH RATE FROM ALCOHOLISM PER 1,000,000 PERSONS LIVING IN VARIOUS TOWNS AND COUNTRIES.

Denmark (towns)	274	Massachusetts	65
Sweden (principal towns)	99	Scotland	61
Paris	95	Italy	47
Switzerland	88	England and Wales	46
Scotland (eight towns)	83	Berlin	40
Connecticut	80	Vienna	36
Belgium	76	Sweden	34
London	74	Ireland	30
Russia in Europe	70	Holland	21

As a matter of fact, returns of the mortality from alcoholism, except in some of the European countries where it is not safe to violate a law, are of doubtful value, as comparatively few deaths are set down to intemperance, pure and simple, although a large number of complaints are no doubt brought on or aggravated, and many lives are doubtless shortened. from that cause, which, however, is not mentioned in the returns.

The Collective Investigation Committee of the British Medical Association some time since inquired into the effects of the consumption of alcohol upon the duration of life, and received information respecting the habits of 4,234 males who died at different ages, all, however, being over 25 years of age. The result of this inquiry was published in the *British Medical Journal* of the 23rd June, 1888, and is to the effect that although strict moderation in the consumption of alcoholic drinks is favorable to longevity, total abstinence is not so—the average life-time in the group containing the total abstainers being apparently shorter than that of the members of any of the other four groups into which the individuals respecting whom observation was made were divided. The following is a description of the five groups, and a statement of the average age at death of the members of each group:

EFFECTS OF ALCOHOL ON THE LONGEVITY OF MEN.

Alcoholic Groups.	Average Age at Death.	
	Years.	Days.
1. THE HABITUALLY TEMPERATE—Men who drink small amounts, and only with meals, and rarely take spirits except for medicinal purposes (the latter part of the definition not to apply to whiskey drinking countries)	62	50
2. THE MODERATE DRINKERS—Men who, without being intemperate or free drinkers, yet do not confine themselves within a rigid rule; who do not object to drinking spirits occasionally as a beverage; who may at times drink between meals or even to the extent of intoxication occasionally, but who do not make these practices a habit; and, on the average, do not materially exceed what has been termed the "physiological amount" of 1½ oz. of pure alcohol daily	59	246
3. THE FREE DRINKER—Men who drink a fair amount, or take their wine freely, habitually exceeding the physiological amount of material extent; but yet who cannot be called drunkards or considered to have forfeited their character for sobriety....................	57	216
4. THE INTEMPERATE—Drinking men, hard drinkers and drunkards..................................	53	14
5. THE TOTAL ABSTAINERS..............................	51	80

PULMONARY CONSUMPTION.

Phthisis, or pulmonary consumption, caused about 100,000 deaths in the United States and 2,977 in the State of Maryland during the census year of 1880. Except during the prevalence of epidemics, consumption is the occasion of more deaths in every State of the Union than any other disease, the aggregate for the whole country being a little over 12 per cent. of all deaths having reported causes. Next to phthisis, diseases of the nervous system and diarrhœa are the most fatal diseases of the list. It should be borne in mind, however, that the deaths ascribed to diarrhœa are for the most part those of infants and young children, whilst the majority of the victims of phthisis are at the adult period of life. Undoubtedly a larger proportion of blacks and half-casts fall victims to this complaint, and this appears to be the case under all conditions and climes, even in places where their primitive mode of life is but little interfered with. Can one help asking, What is the cause of this great and apparently increasing prevalence of consumption among the race?

According to Hirsch, one-seventh of the human race are destroyed by consumption. There seems to be no therapy for the disease. When once it occurs, it is almost necessarily fatal in its effects. This is a gloomy outlook. The only hope for mankind lies in preventive measures, and to bring such measures to the attention of the public is the object of this publication.

Riverious made the observation as long ago as 1668 that "contagion is the chiefest cause of consumption." Similar observations have been made every decade since, and yet no general acceptance of the infectiousness of the disease ever obtained until very recently. Modern pathologists, in the slow evolution of their investigations, have finally reached the same conclusion.

What especially prevented the acceptance of the theory of infection was the widespread belief in the almost exclusively hereditary transmission of the disease. Of this transmissibility there is no shadow of doubt, but, fortunately for the human race, heredity does not account for a majority of the cases. A large contingent develops entirely independent of heredity. To invoke the possible existence of the disease in the ancestry is a convenient and safe refuge; but such an explanation savors too strongly of empiricism to satisfy the more accurate demands of modern times. That consumption is acquired oftener than inherited is a fact which becomes more and more patent every day.

The following are the principal conclusions which modern pathologists have arrived at regarding tubercular consumption:

FIRST.—That tuberculosis depends upon a specific virus or germ which must reach a mucous membrane or a broken surface, to be absorbed and induce the disease.

SECOND.—That this virus or germ is breathed for the most part into the lungs, or is swallowed with food, as with milk or the flesh of tuberculous animals.

THIRD.—That this germ itself is (or includes) the specific morbific matter of the disease, and constitutes the material by which consumption is propagated from one person to another, and disseminated through society.

FOURTH. That this matter never originates spontaneously, but is perpetuated solely by the law of continuous succession.

FIFTH. That by the destruction of this matter or germ on its issue from the body, by means of proper chemicals (disinfectants) or otherwise, seconded by good sanitary conditions, there is reason to believe that we may eventually rid the human race of this fatal scourge.

SIXTH. That tubercular disease once acquired rarely disappears from the body entirely, but for the most part leaves centres of future infection. It strikes with its victims "a truce rather than a peace."

A general recognition of these views clears the field for prophylaxis, and opens up a new and more promising outlook. It may be reasonably concluded that a large number of individuals, while in the enjoyment of robust health, will withstand the influence of tubercle taken in by the stomach, but it must be otherwise with the weak and young, those with poor feeding and worse air, those living in crowded habitations, in damp, sunless localities, and subject to much exposure.

There is a strong probability that the disease is, in a large majority of cases, due to a microbe—*bacillus tuberculosis*—breathed into the lungs, which may be locked up for some time in temporary innocence; but, finally, under favoring circumstances or in certain conditions of the system, will branch out into its special pathogenic development.

Several cases have been reported in the *Berlin Wochenschrift* to which the disease had been clearly communicated by a consumptive nurse, and in none of which could be traced any history of hereditary phthisis. A thorough sifting of most cases of consumption would, no doubt, show that the disease is acquired oftener than inherited.

Bad air, bad food and bad sanitation are, no doubt, direct factors in the disease, but only when they contain the virus or germ of the disease. In other respects they are no worse, for tuberculosis than for any other disease. Drinking water contaminated with sewage does not produce typhoid fever unless the sewage contains the typhoid germ. So, contaminated air is productive of tuberculosis only when a cause of its contamination is tuberculous virus.

Without denying the contagious nature of consumption, of which the demonstration seems to have been peremptorily made by the discovery of the specific bacillus, we may at least consider the different circumstances in which this contagion is supposed to take place. Thus butchers meat is at present considered a source of infection, and its use in our daily food is thought to be accompanied by actual risk to our health. Starting from this idea, it is customary to recommend, as a general rule, and one that admits of no exceptions, the thorough roasting of all meat coming from a source of which the purity is not absolutely guaranteed. But, in the first place, the danger of infection by butchers meat has not been rigorously proved. Furthermore, it has been found impossible to carry out the rule which we have just mentioned; besides it may be the source of actual harm, as it is unquestionable that prolonged cooking of meat lessens its nutritive qualities.

Similar remarks are applicable to the question of milk, which is usually a perfectly harmless article of food, and which can only offer risk in cases that are very rare and where the danger can be readily foreseen, that is to say, when the cows udder bears traces of tuberculous lesions. Those who recommend the use of boiled milk forget, besides that, there are many persons who digest milk more easily in its natural state.

When we come to consider the question of contagion by means of the sputa, no one will deny that it is highly probable, but it will be very difficult to succeed in getting the patients or the persons about them to carry out the precaution necessary to put an end to this source of infection. And this is not all; these precautions seem likely to bring about a result diametrically opposed to the one desired. We have only to think a moment to realize that it is altogether improbable that any traveler will consent, on arriving at a hotel, to take a room that is whitewashed, that is carpeted with oilcloth, and that is without curtains or bed hangings—in a word that is furnished in accordance with the principles of the ultra-contagionists. We can be quite affirmative in saying that rooms fitted up in this style will remain unoccupied indefinitely. This is carrying precaution to excess, and such ideas are annoying and possibly slightly childish.

It is furthermore to be noticed from another point of view that the excessive multiplication of these precautions, and the wide publicity which their upholders wish to give them, seem likely to be more harmful than useful to unhappy consumptives, as in this way their disease will become a source of exaggerated apprehension to the persons around them. It is easy to see that a state of mind of this kind will not be precisely calculated to spur on the solicitude of their relatives, but that it will rather tend to diminish the careful attendance of which these patients stand so much in need.

To sum up, in this matter we think that the best line of action to follow is to leave to the physician in charge of the case the initiative in all measures to be taken to lessen the risk of contagion. The physician is fully qualified to do this, and he is the only competent person to indicate the precautions that may be necessary. The laws of sanitation in no wise require us to sacrifice everything to the avoidance of a danger which, whatever some persons may think, still seems to many competent minds rather apparent than real.

ANNUAL DEATH RATE FROM TUBERCULAR DISEASES IN VARIOUS COUNTRIES, 1881 TO 1884.

	Deaths from Tubercular Diseases per 10,000 Persons Living.		Deaths from Tubercular Diseases per 10,000 Persons Living.
Austria (principal towns)..	72.20	Denmark (towns).........	30.42
Austria..................	38.39	Spain (towns)	29.24
Belgium (towns)..........	35.11	Scotland	25.93
Germany (principal towns)	34.40	Italy.....................	25.54
Massachusetts	34.25	Ireland	22.43
Switzerland (towns).......	32.50	Switzerland	21.79
Sweden (towns)	31.61	England and Wales.......	21.09
Scotland (eight towns).....	31.12	Holland	19.73
Prussia	30.88	United States (during 1880)	18.30
Belgium..................	30.48	Spain	12.32

SUICIDAL DEATHS.

So strong is the propensity in the human mind to dwell on and imitate follies and atrocities, which excite at first an emotion of disgust if not of horror, that the constant publication of crimes in the daily papers goes much further to familiarize the vicious with them, than it does to prompt one to shun and detest them. There is scarcely a narrative of a suicide, particularly if it become of an unusual fashion, which does not give strong probability of some one who reads or hears of it being induced to commit a similar act. It is to be feared, therefore, that extended publications of such acts by the press will tend to engender a repetition of the deeds which it records. Gall informs us of a man who, in reading in the newspapers the particulars of a case of murder, perpetrated under circumstances of peculiar atrocity, was instantly seized with a desire to murder his servant, and would have done so had he not given his intended victim timely warning to escape.

The sane man who lowers himself beneath the standard of the brute animal by his last act, should not be treated with any more notice than the dead quadruped. This may sound harsh and grating to some sensitive minds compassionate of others' follies, as well as of others' suffering; but a little reflection will suffice to convince any one that this view is the most humane, besides being the truest, if measured by a practical application, as a discouragement against the folly and sin of suicide.

Even if we suppose, which indeed we can hardly doubt, that generally the act is done in a moment of insanity—this very morbid frame of mind itself has been sometimes created, often exasperated by false philosophy—it is horrible dogma, that a man has a right to take away his own life, rather than by living to remain a burthen to himself and his fellow-men.

The philosophy would be quite as sound, and sustained by as plausible arguments, which justified a man in murdering another person, because, for example, the latter may have been a criminal in the eye of the law; or a drone, and worthless in the eye of the political economist; or a cipher, a bare entity in the opinion of the man of genius. Certain it is, suicide can never be considered an act of courage, and may be generally classed as a crime against God and man. It is correctly remarked by Mr. Winslow, "that, the alliance between suicide and the murder of others is a closer one than is generally supposed. How many instances are recorded in which suicide and homicide have been conjoined. He who would not scruple to take away his own life will not require much reasoning to impel him to sacrifice anothers." Numerous are the proofs of this last assertion furnished in the public journals of both Europe and this country within the last few years.

It appears that the Roman laws respecting suicide were of a fiscal nature. They viewed the act not as a crime in the abstract, but considered how far the circumstance affected the state of the treasury. In some portion of the Roman empire the magistrate had the power of granting or refusing permission to commit suicide. If the decision was given against the applicant, and he persisted in sacrificing his life, disgrace and ignominy were heaped upon his body, and it was buried in the most humiliating manner.

So little can short-sighted man foresee his future fortunes, that even in the period of greatest depression, events may be in preparation which would give an entirely new coloring to his life, and raise him from despair to hope and joy. One among many examples of this truth is given in the reply of Napoleon to some persons who thought that he ought, after his downfall, to have played the Roman, and put an end to his life: "If Marius had slain himself in the marshes of

Minturnae, he never would have stood the seventh time for consul." So, also, to give an illustration in the person of the French emperor himself, we might say : If Napoleon had slain himself after his abdication at Fontainbleau, or on his way to exile in Elba, he never would have again traversed France, and shown to all Europe the intense enthusiasm of the people in his favor.

An Englishman and Voltaire concluded a discourse one evening on the depravity of mankind, and the little motive for remaining on this earth, subject, as they were, to others' tyranny and injustice, and the various inflictions of disease, by a joint resolution to commit suicide on the following morning. The Englishman, firm to his resolution, rose, and expected Voltaire to perform his promise ; but the genius replied : "*Ah monsieur, pardonnez moi, j'ai bien dormi, mon lavement a bien opere, et le soleil est tout-a-fait clair aujourd' hui.*" Ah ! Sir, excuse me, I have had a good night's sleep ; my clyster has operated well, and the sun shines brightly to-day.

Hanging is the most common mode by which men commit suicide, drowning and shooting with almost equal frequency the next, cutting or stabbing the next, and taking poison the next. Females most frequently take their lives by drowning, or by taking poison, next by stabbing or hanging, but rarely by shooting. It may be mentioned, however, that suicide by shooting is much more common now than formerly.

In general the proportion of persons who commit self-destruction does not average more than one in about 10,000; but among the Chinese in this country and Australia suicide occurs much more frequently. The total number of Chinese in the Colony of Australia is about 12,000, and those who committed suicide in 1887 were in the proportion of about one in 6,000, and during 1888 about one in 2,000.

The Registrar General of England in his 46th report gives the following table, showing the proportion during ten years of suicides affected by different methods in England and Wales:

MODES OF COMMITTING SUICIDE IN ENGLAND AND WALES.

METHODS.	Number by each Method per 1,000 by all Methods.	
	Males.	Females.
Hanging or strangulation........	400	268
Drowning	165	333
Cut or stab......	212	149
Poison	79	172
Shooting	68	2
Jump from height	20	36
Railway train..................	24	7
Otherwise	32	33
Total	1,000	1,000

Mulhall. in his "Fifty Years of National Progress," has pointed out that suicide is a more terrible destroyer of human life than war, for whilst during the first fifty years of Queen Victoria's reign war occasioned 52,000 deaths of subjects of the United Kingdom, and 316,000 deaths of subjects of France, Germany and Austria, suicide claimed 77,000 victims in the first-named country and 610,000 victims in the other three countries named.

Sydenham informs us that at Mansfield in a particular year, in the month of June, suicide prevailed to an alarming degree from a cause wholly unaccountable. The same thing happened at Rouen in 1806, and at Stuttgart in the year 1813. One of the most remarkable epidemics of the kind was that which prevailed at Versailles in the year 1793. The number of suicides in the year was 1,300—a number out of all proportion to the population of the town, which at that time was probably about 50,000 inhabitants.

Most readers of history have heard of the epidemic at Miletus, which displayed itself by the ladies of the city destroying themselves by hanging in the absence of their husbands and lovers, and of a similar mania at Athens. Writers are not agreed in respect to which of these two cities the prevention and cure were found, by exposing naked, in a public place, the bodies of the suicides.

By the following figures, which have been derived from various sources, it appears that suicide is more common in twenty-four countries than in the United States, whilst there are only three countries named in which suicide is less common than in the United States:

DEATHS FROM SUICIDE IN DIFFERENT COUNTRIES.

	Deaths from Suicide in each year per 100,000 Persons Living.
Saxony	31.1
Denmark	25.8
Schleswig-Holstein	24.0
Austria	21.2
Switzerland	20.2
France	15.7
German Empire	14.3
Hanover	14.0
Queensland	13.5
Prussia	13.3
Victoria	11.5
New South Wales	9.3
Bavaria	9.1
New Zealand	9.0
South Australia	8.9
Sweden	8.1
Norway	7.5
Belgium	6.9
England and Wales	6.9
Tasmania	5.3
Hungary	5.2
Scotland	4.0
Italy	3.7
Netherlands	3.6
United States	3.5
Russia	2.9
Ireland	1.7
Spain	1.4

The science of statistics, or the application of numbers to the verification of medical opinions, will correct many a popular notion and scientific dogma. Among those is the assertion that the changeable and particularly foggy climate of England, is favorable to suicide, but Mr. Winslow has shown that in Holland, the climate of which is much more gloomy than that of England, there are fewer suicides than in the latter country, whilst in France, more favorably circumstanced on the scene of friendly skies, there are more instances of this catastrophe.

The average number of suicides in England shows the months of April and June to have the preference, and November to exhibit the least. The proportion of suicides in November is to those in April as 3 to 9. At Paris the larger number of suicides occur in spring and summer. It is a mistake to suppose that life insurance leads to suicide. Out of 120,000 persons who insured their lives in the London Equitable Insurance Company, the number of suicides in twenty years was only fifteen.

On the subject of etiology it is worthy of especial note, not on account of its novelty, but as a text for continual and much more vigilant and open and manly dissuasion from indulgence in the bottle than many, shall we say most, physicians are inclined to attempt, that in a very large proportion of cases of insanity admitted into the asylums and hospitals devoted to the reception of this unhappy class of patients, the mental impairment can clearly be traced to habits of intemperance; and of the disposition to suicide thus induced we have too many melancholy examples.

From an examination of the particulars of 1333 cases of persons who committed suicide, and who were examined after death, the following analysis is made. The particulars of the cases referred to are recorded in the works of Pinel, Esquirol, Fabret, Fodere, Arntzenius, Schlegel, Burrowes, Haslam, &c.

Thickness of cranium	150
No apparent structural change	100
Bony excrescences	50
Tumors in brain	10
Simple congestion	300
Diseases of membranes	170
Disease of lungs	100
Softening of the brain	100
Disease of stomach	100
Appearance of inflammation in brain	90
Disease of Intestines	50
Diseases of liver	80
Suppressed natural secretions	15
Disease of heart	10
Syphilitic disease	8
	1,333

Accretions of the membranes of the brain are often found in suicides. The dura water is often ossified, and the pia water inflamed, and the arachnoid thickened. Osiander considers congestion of the vessels of the brain a frequent cause of suicide.

LEPROSY.

For some time past American public opinion has been somewhat disturbed by the fear of leprosy. This loathsome disease is, we have been told, far from extinct; it is, on the contrary, spreading. The nerves of the public have been considerably shaken, and their apprehensions rendered much more keen, by the recent and overwhelming epidemic of la grippe. If we had this disease crossing the Atlantic, as it were yesterday, why not leprosy to-morrow? The fact that one was possible does not in any way prove that the other is probable; but fear is not very logical, nor does it pause to scientifically analyze evidence and facts. Some time ago we were content to think that leprosy did not exist in this country. It might still prevail on a large scale in Norway, Sweden, India, China, or the Sandwich Islands. Therefore why should any anxiety be felt in our country of civilization? Unfortunately, this confidence was rudely shaken by the announcement that the disease existed in several of the Western States. It is no great consolation to say leprosy exists only in distant States or countries. With rail and steam distance is no longer an obstacle.

What is wanted is not the suicide of lepers, which is said to be the only safe and certain haven of the Indian leper, but that they should so far sacrifice themselves as to consent to live apart in special settlements or hospitals assigned to them. If this is not done voluntarily, then it is urged that laws should be enacted rendering segregation obligatory. This segregation is practiced in Norway, and the result is that leprosy has been reduced in the proportion of about 60 per cent., while in the English dependencies it is increasing, and now we hear that there are 600 lepers at the Cape Colony. In the Hawaiian Islands, also, the number of lepers, which at one time was nearly equal to 800, has greatly decreased since the system of isolation has been put in force. It is said there are at this time as many Norwegian lepers in the United States as in Norway, in spite of emigration laws against lepers, but thus far the disease has not spread, either by contagion or by hereditary transmission- with good food, plenty of exercise and much care, the complaint can be kept under for a long time; but the leper, especially if he is poor and has no proper means of nursing himself, should be confined to a special area or asylum, and should not be allowed to circulate among the general population.

PART VI.

ADULTERATION OF FOOD SUPPLIES.

To institute a thorough examination into the prevalence of food adulteration would require a much larger expenditure of money than has been accorded the State Board of Health for conducting this department. It would require the entire time of a competent chemist and at least four competent inspectors with salaries ranging from $1500 to $600 per annum, and in addition a considerable sum, at least $2,000, for incidental expenses, such as chemicals, cost of samples, travelling expenses, &c. Under the present appropriation, however, a great deal of good has been effected, though the inspectors and chemist could be paid comparatively meagre salaries, and could not be kept at work continuously. Some difficulty has been experienced in obtaining samples. A circular was issued requesting the co-operation of the public and local board of health but the number of samples gathered by this means was very small. Through the energy of Prof. Tonry, the chemist of the Board, and the personal efforts of the secretary of the Board, many samples of variou articles were procured. Some, chiefly milk, were examined by Professor Tonry, others by the Chemical Department of the Johns Hopkins University, and several other chemists. Whenever a contention arose as to the correctness of an analysis reported, the analysis was invariably repeated by another chemist, selected jointly by the Board and the parties charged with selling or having for sale the suspected article.

A very large number of samples of milk were examined, and a large proportion of the samples were found to contain water, in excess of what is deemed proper in milk sold for consumption in families. Fully one-fourth of the milk sold by retailers and from carts in the city is heavily watered; and not more than one-fourth of all the milk sold, can be considered as absolutely pure, if we use the standard of purity adopted by Massachusetts, New York and New Jersey. A number of arrests have been made of parties charged with selling impure milk, and indictments were promptly found by the grand jury, but no convictions have been obtained before a petit jury.

Milk, pure and sweet, is a necessity in every family, and the question is how to obtain it in its native purity, and how to supply it in the best condition. Now the only question is how to bring these classes into communication, by furnishing some methods of shipping milk long distances without injuring its quality. There are always numbers of farmers, in different sections of the country, who could furnish large quantities of milk if there was some way to put it on the market in good condition, and the man who solves this difficulty will also solve, to a great extent, the problem of supplying our large cities with pure milk. There is no doubt that many city dairymen, on account of the high price of their stables, and also the high price they are forced to pay for their feed, are under the necessity of pushing and stimulating their cows too much to bring their milk flow up to a profitable basis in their expensive situation. This, from necessity, fevers the blood of the cows and excites their nervous system, and this very quickly affects their milk. Again, a great many city dairymen keep their cows in stables, or close yard, from one year's end to another, without, in many cases, any adequate supply of nature's health-invigorating green pasture, or even its substitute. Brewers' grains and other equally unhealthy products often enter largely into their feed. The stables very often are close, illy ventilated, filthy and unhealthy, and the yards scarcely less so. Now with the farmer's cow it is far different. She, at least half the year, is fed upon nature's food—clean pasture; the balance at least clean hay and grain, for the reason that the majority of farmers have no other kind of feed and no opportunity to get it. In almost every respect his cow is treated more in accordance with nature's decrees. She is not over fed, or too highly stimulated, for her most healthful condition; as the farmer keeps his cows, as a rule, either for breeding purposes or for supplying his own family, or, more generally for both purposes. In either case it best subserves his interests to keep her in as nearly a normal condition as possible. Consequently her milk is pure and healthy, and should enter more largely into city consumption.

A good way of securing such milk is suggested by the use of crates of glass jars with sealed air-tight tops. Such should be plainly marked with the name and place of producer. Such could be regularly supplied to families daily. Two sets of jars should be used. When a full jar is left the empty one left with the milk on previous day should be returned. Arrangements can always be made with the railroad companies to return the empty crates free of charge.

The custom of mixing large quantities of good, bad and indifferent milk into great tin cans is not a good way to secure the best grade of milk. The jar system would give opportunity for individual producers to establish a choice supply by introducing to public favor the superiority of certain brands.

A careful comparison of the results with the facts developed during the time which the present law has been in force shows clearly that food adulteration is practiced in this State at the present time to as great if not to a greater extent than prevailed in New York and Massachusetts at the time of the agitation which led to the enactment of repressive laws in those States.

About 200 samples have been examined. Of these seventy-five were obtained from sources supposed to be pure, and the balance were considered suspicious. Of the former about 10 per cent. were found to be adulterated; of the latter nearly 50 per cent. were condemned.

There is no doubt that the preservation of food in hermetically sealed cans has added much to the health and comfort of the public, still it is no less certain that unscrupulous tradesmen have dealt in damaged, unsound and unwholesome canned food, and that sickness has occurred therefrom, until the public confidence has been shaken and a large portion of the community look with doubt and distrust upon food thus preserved. This should not apply to the more reputable dealers, but only to such parties as deal in what is called "seconds," or doubtful goods, which are sold principally to the poor at reduced rates. It is a well-known trick of unscrupulous dealers to go the round of the wholesale trade and buy up cans which in the language of the trade are known as "swells." In good cans the heads are concave or "bulged in," but if decomposition begins the gases that form inside the can distend and force out the heads, giving them a convex or "bulged out" appearance.

A late number of the *Revue d'Hygiene* calls attention to a process of falsification of coffee, which consists in grinding up a mixture of flour obtained from roasted grain and of dextrine, and moulded into coffee grains. These grains are sufficiently well imitated to make them difficult of recognition when seen mixed up side by side with real coffee. Among other articles found adulterated, may be mentioned cream of tartar, adulterated with sulphate of lime, alum, and acid phosphate of lime; baking powders, adulterated with alum, acid phosphate of lime, alkaline salts, &c., black pepper, allspice, ginger, mace, cloves, cinnamon, vinegar, pickles, &c., &c.

Dr. Clifford Mitchell, of Chicago, cites a case "for the benefit of dyspeptics, showing clearly the detrimental effects on the digestive organs of bread adulterated with alum, plaster, and worse, with blue vitriol." A certain gentleman of Chicago, who seldom eats any but home-made bread, one day when in good health, partook at all three meals of the so-called "Vienna bread," eating altogether nearly a loaf. In the evening he was troubled with nausea, severe pain in the stomach and bowels, eructations and persistent heartburn, which continued for several days. Analyzing carefully the bread partaken of, the doctor found alum in considerable quantities. The analysis was confirmed by Mr. Fuller, of New York, with the microscope and polariscope. Alum, says Dr. Mitchell, is an astringent, and when taken constantly in bread there is a decrease in the quantity of secretions in the intestinal track, causing indigestion. The disagreeable effects of eating bakers' bread, varying in intensity, according to the physical constitution of an individual, manifest themselves within twenty-four hours.

The complaints are general among consumers that frauds and injuries are done to them by dealers selling them butter adulterated with oleomargarine. Notice has been sent to vendors in the city and other towns that if they sell oleomargarine they must sell it as such, and nothing else. The fact that there is not over one pound in ten of oleomargarine retailed as oleomargarine is what has justly brought condemnation upon the entire oleomargarine business. If oleomargarine were made of clean, pure suet and lard, and sold for the price of lard and suet instead of the price of butter, there would be no fraud financially or injury to health. There are producers of pure butter in this State, and they should be protected against the deceits of oleomargarine frauds. Chemical investigations tend to show that while it may be possible to make oleomargarine which would not be an unhealthful food, as a matter of fact no such oleomargarine is made. Indigestible, insoluble, and even putrescent substances are employed in the patent processes of manufacture, among which may be enumerated sugar of lead, bisulphate of lime, saltpetre, borax, boracic acid, salicylic acid, benzoic acid, etc., etc. These things are well enough in their way, but not to spread on one's bread. Both butter eaters and butter makers are entitled to protection against counterfeit butter.

Since the publication of Dr. Henry Behrend's notable article in the *Nineteenth Century* on "Diseases Caught from Butchers' Meat," the sale of beef has been subjected to more careful inspection for the interception of tuberculous animals, and also animals with "lumpy jaw" or *actinomycosis*, which Dr. Hewett, Secretary of Minnesota State Board of Health, says, "very commonly affects the lungs, bowels, and the glands all over the bowels." Quite a large number of cattle suffering with this disease have been detected and destroyed by the active meat inspector of the Board, Mr. I. Robert Godman. The Board has directed that all such animals be isolated and their flesh destroyed, and it will stand firm on this decision, though some cattle dealers complain that they are unjustly suffering loss thereby.

The case is eminently one in which the consumers of milk and meat may call upon the legislature to do for them what it is impossible that they should do for themselves. A fear of the curtailment of individual liberty is prominent among the motives of some of the more respectable of those by whom health-preserving legislation is hindered and condemned. Such people forget that the first duty of a State Government is to protect the life and health of the governed, and that the means necessary for the attainment of these ends must increase in number and complexity according to circumstances. A man may, by his own efforts, secure a healthy habitation for himself; but there his power of self-protection against disease may almost be said to terminate. He has a right to call upon the State under whose laws he lives to protect his sources of water supply, of milk supply, and of meat supply from being poisoned by the negligence or cupidity of others, to prevent his neighbors from exposing him to the contagion of small-pox, because they prefer to have their children unvaccinated, to restrain persons suffering from infectious diseases from frequenting public places and using public conveyances, and generally to do for him, in relation to such matters, what he is unable to do for himself. And reasonable requirements, should not hesitate to curtail liberty to do evil, and should be guided by the counsels of humanity rather than by the outcries of ignorance and folly.

The fact that lumpy jaw is now regarded as communicable from animals to man is sufficient reason why the meat of such animals should not be offered for sale. We find in the October number of *Public Health*, page 54, the following interesting account of the disease:

"Lumpy jaw is the very expressive name by which the common variety of this disease is known among stockmen and dealers in cattle. But few know that it very commonly affects the lungs, bowels and the glands all over the body. It was stated at the Congress of Hygiene in London, last August, that the affection of the lungs was common, and constantly mistaken for tuberculosis, which in its general features, to the naked eye, it resembled.

"The cause is now known to be a vegetable fungus, something like those found on moldy bread, paste, preserves, etc. It is thought to have originated as a parasite of certain grasses, as barley, the beards of which have been found in the tumors caused by the fungus, both in animals and man. The little yellow concretions, like a mass of yellow sand, found in these tumors or the matter coming from them, are characteristic of the disease, and are recognized without the microscope. This affection is very common in some sections of the country (eg. Nebraska) and is quite frequent in cattle offered for slaughter at the great meat centres, Chicago, Kansas City, etc.

"The importance of the subject to us, who are responsible for communicable diseases of animals, is found in the fact that it is reasonably suspected of being communicable from animal to animal, from animal to man, and from man to man. It is only within a short time that the real character of the disease has been recognized or the extent of its ravages on man and beast. There are a few facts admitted by all. The disease can be inoculated from animal to animal, and from man to animals. In both it invades the whole body. It has been found even in the brain of a child: Its presence there, in the lymphatic glands, and in many tissues is only explicable on the theory that it is, in its early stage, transmitted as so many similar disease causes are, through the lymphatics and blood vessels. This is all the more probable since we know that the concretions referred to which were only recently thought to be the disease, are but one and that not the most active form of the fungus. Dr. Frank Billings, who has been studying this disease recently, showed the writer the other day photographs of the bacilli from cultures of this plant in its earliest growth, which very closely resemble the bacilli of other communicable disease both in appearance and size. It seems not an unreasonable inference that this is its earliest form in the body, and that, even if larger than other cocci or bacilli, it could be easily carried in the fluids of the lymphatics and blood vessels.

"That there is a remarkable probability that lumpy jaw is communicable from animals to man is the opinion of the State Board of Health, and it therefore sustained the action brought a few years ago by Dr. Hoyt as Health Commissioner of St. Paul to condemn lumpy jaw meat offered for human food. The case was tried by the judge alone at the request of the defendant, so sure was he of a verdict. The judge decided for the city, and the meat inspection force of St. Paul was increased thereafter. No one surely, will claim that this disease improves the meat; all must admit that in proportion to its extent it injures it, and yet there are those who would have Boards of Health permit it to go on to the market as healthy food. To do that would be to endorse fraud and a falsehood. It is furthermore indecent to sell such meat without notifying the buyer of its real character, and the would-be seller knows that it could not be sold for what it actually is. It is not permitted to be sent to foreign markets, being excluded by the condemnation of most of the inspectors of the Department of Agriculture, but it does not appear that those same inspectors prevent its sale in this country. The Live Stock Commission of Illinois is to-day engaged in a lawsuit, brought to prevent its "rendering" the meat of cattle condemned as lumpy-jawed. A curious feature of the trial was the refusal of the Chief of the Bureau of Animal Industry to take the stand for the Board, though his own inspectors are condemning such meat."

SICKNESS CAUSED BY UNWHOLESOME MEAT.

Often diseased and famished animals are slaughtered and sold for food, and even meat good when slaughtered may become dangerous by improper treatment. The meat of animals suffering with splenic fever, pleuro-pneumonia, foot and mouth disease, trichinosis, lumpy jaw, and tuberculosis should be condemned. We need severe measures to prevent and punish the rascality practiced upon the public by those who deal in diseased cattle. Only a short time since the following telegram from a health officer in one of the Western cities was sent to the Secretary of the State Board of Health of this State: "A lot of 23 cattle, with malignant disease, which had been condemned by this Board has been shipped to your state. Look out for them." The lot never arrived.

The following correspondence will show to what extent the evil is practiced in our own State, and among some of our own butchers:

CHESTERTOWN, NOV. 18, 1890.

DR. ROBERT WARD, *State Veterinarian.*

DEAR SIR—It has been currently reported here that one Jacob Levi of your city has been buying, slaughtering and shipping hogs to your city infected with cholera, and is in the market for the purchase of diseased stock. I learned to-day from a competent and reliable witness that a few days ago a lot of infected hogs were slaughtered and shipped to Baltimore per steamer Corsica. I write to know if a man is allowed to deal with impunity in diseased stock and put such on sale; if he is not, what can be done to bring him to justice. I can furnish the witnesses as to the purchase and slaughtering and shipping; also as to the attempt to buy hogs known to be diseased. An early reply will be appreciated by,

Yours respectfully,
WM. J. VANNORT.

The above letter was referred to the Secretary of the State Board of Health, who immediately wrote to Col. Vannort as follows on the subject:

STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
BALTIMORE, NOV. 21, 1890.

W. J. VANNORT, ESQ.,

DEAR SIR—I am informed that one Jacob Levi has been purchasing diseased animals for the supposed purpose of selling them for food in this city, and that you will be able to give me some information on the subject.

If there is any possible way of establishing the fact that he purchased the animals *with the intention* of selling them for human food, or that he has actually slaughtered and sold them for that purpose, I will institute proceedings against him immediately, under the act of 1890, Chap. 604. If possible, get Levi, or some one of his employes, to admit the facts before a witness, and I will at once swear out a warrant for his arrest. Dr. Frank Hines of Chestertown, is the authorized Inspector of this Board for Kent County, and will, I am sure, give you all the aid he can in this matter. It is important to have witnesses—indeed, necessary. I shall be under great obligations to you and Dr. Hines if you can manage to fasten the guilt upon Levi.

Yours truly,
C. W. CHANCELLOR,
Secretary State Board of Health.

CHESTERTOWN, NOV. 27, 1890.

C. W. CHANCELLOR, M. D.:

MY DEAR SIR—Yours of 21st inst. came duly to hand and contents noted. Mr. Robert Kemble informs me that Jacob Levi bought diseased hogs of Mr. Meeks, and Kemble dressed them, and Levi shipped said slaughtered hogs to Baltimore about three weeks ago. Mr. Meeks said to me the hogs were sick, and Levi knew it when he bought them. Levi at divers times has bought diseased hogs, I am creditably informed, from James Bennett, John W. Doud, John Morris and others, and shipped them to Baltimore, and I have heard that Levi has been in the habit of buying diseased hogs, knowing them to be unsound. It will be a difficult matter to prove his intention at time of purchase, but when such stock is shipped at night and arrives in the city at night it looks as though something was wrong. I intend to see Dr. Hines and make diligent inquiries as to the intent of Levi at the time of purchase, and have Dr. H. interest himself in the matter, and will advise you of the result. I can furnish witnesses to prove the purchase and slaughter of the diseased hogs spoken of whenever it may be necessary.

Yours respectfully,
WM. J. VANNORT.

Inspectors were at once notified to keep a sharp lookout on Levi, and to watch all boats arriving from Chestertown; but we were not able to capture any meat shipped by Levi, and as nothing further was heard from Col. Vannort it is supposed that the parties who had been engaged in the unlawful traffic, suspected that they were being watched and abandoned the nefarious traffic.

THE EFFECT OF EATING PUTRID MEAT.

Eating putrid meat often gives rise to serious symptoms. At Zurich, Switzerland, 600 persons were made ill from eating meat in a state of incipient decay, and many of them died. Ollevier reports an instance where six people ate some putrid mutton, and became violently ill—four died. Christison mentions the fact of 14 persons having been made ill from eating veal slightly decomposed. During the cholera epidemic in London in 1848-9 it was clearly proved that those persons who ate meat in a state of semi-putridity invariably suffered with the disease. In one of our American hospitals a few years ago there were several epidemics of fever, diarrhoea, &c., which were traced directly to the use of beef-tea made from somewhat decomposed meat. There can be no doubt that foetid diseased meat, and every other kind of vile meat is often used in the manufacture of sausage, where it is spiced into obscurity. The most common source of trichinosis is from eating bologna sausage made of infected meat. Diseased cattle, and very young or even foetel calves and pigs have been known to be made into sausage and sold for human food. How many of the sick, starved, maimed, and dead animals that reach our cities on cattle trains from the west go to rendering establishments? Very few; but the inference is strong that they go to our markets and are sold as human food in one shape or another.

STANDARD FOR CONDEMNING MEAT.

In London the health officer requires to be seized the flesh of all animals infected with parasitic diseases, of animals that have been suffering with acute, febrile or wasting diseases, and of those that have died from natural causes or accident, as well as all meat tainted in any way.

MILK IMPURITIES.

Milk is rendered impure, (1) by improper food given the cattle. Distillery waste and what is known as beer grains produce milk of low nutritive powers. Unless properly mixed with other food, this kind of food will produce milk dangerous to infants; (2) milk from cows soon after calving should not be sold; it produces intestinal troubles in children; (3) cattle kept in filthy stables, especially in towns and cities do not produce healthy milk; (4) milk from diseased cattle is especially dangerous, and particularly hazardous to infant life. Tuberculosis is apt to exist among milch cows when crowded in ill ventilated stables and many believe the disease may be transmitted through the milk, but this cannot be positively asserted. We do know, however, that some of the contagious diseases are transmitted through milk.

It has been known for some years that both typhoid fever and scarlet fever are frequently diffused by the agency of a contaminated milk supply; and more recently the same has come to be believed with regard to diphtheria. The active agent in the diffusion of typhoid fever is usually fouled water; and in all the known instances of milk typhoid which have been carefully investigated, there has been proof or high probability that such water has been used either for the purpose of dilution or for cleansing the cans and other utensils. In the case of scarlet fever and diphtheria, there has never been any evidence to connect these diseases with contaminated water, and it was for a long time assumed that their diffusion through milk could only be due to direct contagion proceeding from the persons employed either in the dairy, or as distributors of the milk to customers. This hypothesis derived additional probability from the fact that, in most of the instances, some of the dairy workers had been the first sufferers from the malady; and it was supposed that particles of their peeling skin, in which the contagious influence is known to be present in great activity, must have been suffered to fall into the milk about which they were engaged. An instance of undoubted milk scarlet fever, which did not admit of being explained in this ordinary manner, directed the attention of Mr. Power, a Medical Inspector of the Local Government Board of England, to the condition of the milk itself as a possible source of the malady; and he discovered that certain cows in a dairy at Hendon had been affected by a peculiar eruption about the udders, and by loss of hair in patches, only a short time before persons who drank the milk of these cows were stricken down by scarlet fever.

At the point where Mr. Power's investigations terminated, those of Dr. Klein, the distinguished bacteriologist commenced; and the latter gentleman completed the case. He has shown by inoculation of living animals and by other experiments, that scarlet fever is due to the presence and growth within the body of a definite micrococcus, which can be recognized by its behaviour under culture and by its effects; that the cow is liable to scarlet fever, as an illness so slight as to be scarcely noticeable, and that the milk of the animal thus affected, either by its own properties or by admixture with secretions from the udder in the act of milking becomes an ordinary means of the transmission of the disease. Whether the disease originated, and still occasionally originates, in the bovine race, or whether the cows receive the infection in the first place from man, is an unsolved problem; but the fact remains that a disease in cows, which may easily be discovered if looked for, is calculated to communicate scarlet fever to those who partake of the uncooked milk of the affected animal.

COST OF FOOD INSPECTIONS IN OTHER STATES.

In New York State, $10,000 was appropriated in 1881 for the work of investigating adulterations and impure food. In 1883, $30,000 was voted by the legislature for the same purpose. In New Jersey $6,000 is appropriated for the same purpose. In Massachusetts the State Board of Health has an appropriation of $18,500 for inspection of food and drugs, and other matters connected therewith, including analyses, &c. In Canada very liberal appropriations are made for the food and drink Inspection Department. When the work of inspection was first begun in Canada more than 50 per cent. of the articles examined were found to be adulterated—in a few years this percentage has been reduced one-half. It is estimated that in States having no inspection laws the staple articles of food and drink have suffered adulteration from 45 to 65 per cent.

AN ORGANIZATION EFFECTED.

As soon as practicable after the publication of the law, entitled "An Act to Provide for the Prevention of the Adulteration of Articles of Food and Drink" approved April 8th, 1890, the State Board of Health met and formulated a plan for carrying out the provisions of the law, by appointing the Secretary of the State Board of Health Superintendent of the Department, with authority to appoint analysts and sub-inspectors, and to provide rules and regulations for their guidance. The work of organizing the Department was greatly facilitated, and many of the difficulties anticipated were removed by adopting, with certain modifications, the regulations published by the Massachusetts Board of Health in 1885, after an experience of several years; during which the difficulties experienced by the Board in the first years of its work had in a great measure been removed.

INSTRUCTIONS FOR ANALYSTS AND INSPECTORS.

1. Analysts and inspectors shall report monthly, or oftener if required, to the Superintendent of the Department, and receive such additional instructions to these as he may deem necessary to promulgate.

2. It shall be the duty of the inspectors to procure samples of drinks and articles of food at such times and places as the Superintendent shall direct, in the manner provided by these rules.

3. Under the direction of the Superintendent, one of the inspectors shall, for the identification of samples, affix a number to each sample of food or drink obtained by him, beginning with number one, and taking each alternate or odd number thereafter, without limit; and the other inspector shall use and affix each alternate or even number, beginning with two, and follow such form of numbering, without limit,

also, as far as may be directed. Under no circumstances shall an inspector convey any information to an analyst as to the source from which any sample was obtained.

4. The inspectors shall keep records of each sample, each record to include the following items:

(a) The inspector's number.

(b) The date of purchase or receipt of sample.

(c) The character of the sample.

(d) The name of the vender.

(e) The name of the city or town and street and number where the sample is obtained, and in the case of a licensed milk peddler, the number of his license.

(f) As far as possible, the names of manufacturers, producers, or wholesalers, with marks, brands, or labels stamped or printed upon goods.

5. It shall be the duty of the analysts so appointed, to determine, under the direction of the superintendent, by proper examination and analysis, whether articles of food and drugs, manufactured for sale, offered for sale, or sold within this State, are adulterated within the meaning of the law. Adulteration being defined as follows, viz.

In the case of drinks, (1) If sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein, unless the order calls for an article inferior to such standard, or unless such difference is made known or so appears to the purchaser at the time of such sale. (2) If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or standard work on Materia Medica, it differs materially from the standard of strength, quality or purity laid down in such work. (3) If its strength or purity falls below the professed standard under which it is sold.

In the case of food, (1) If any substance or substances have been mixed with it, so as to reduce or lower or injuriously affect its quality or strength. (2) If any inferior or cheaper substance or substances have been substituted, wholly or in part, for it. (3) If any valuable constituent has been wholly or in part abstracted from it. (4) If it is an imitation of, or is sold under the name of another article. (5) If it consists wholly or in part of a diseased, decomposed, putrid, or rotten animal or vegetable substance, whether manufactured or not, or in the case of milk, if it is the product of a diseased animal. (6) If it is colored, coated, polished or powdered, whereby damage is concealed, or if it is made to appear of better or of greater value than it really is. (7) If it contains any added poisonous ingredient, or any ingredient which may render it injurious to the health of the person consuming it.

6. It shall also be the duty of the analysts to receive such specimens of food and drugs for analysis as may be delivered to them by the superintendent, or by the inspectors, and to examine the same. To avoid, as far as possible, all suggestion or danger of specimens having been tampered with; each analyst shall keep each specimen in his possession in a suitable and secure place, labelled in such a manner as to prevent any person from having access to the same, without the knowledge and presence of the analyst.

Analyses of perishable articles should be made promptly after they are received.

7. An analyst shall give no information, under any circumstances, regarding the result of any analysis to any person except to the superintendent, prior to any trial in court in reference to such analysis.

The analysts shall carefully avoid any error regarding the inspector's number attached to each sample and shall report the results of their work in detail to the superintendent.

In the case of all articles having a numerical standard provided by statute, the result of the analysis should show their relation to such standard.

8. Before beginning the analysis of any sample, the analyst shall reserve a portion, which shall be sealed, and in the event of finding the portion analyzed to be adulterated, he shall preserve the sealed portion, so that in case of a complaint against any person the last-named portion may, on application, be delivered by the health officer to the defendant or to his attorney.

9. Each analyst shall present to the superintendent on the Thursday before the first Saturday of each month, a summary of the analyses made by him during the previous month.

Each analyst shall also present, on or before the first of January of each year, an annual report of the work done for the year ending on the 30th of September preceding.

10. The superintendent shall have charge of the reports of analyses, and shall cause cases founded on such reports to be submitted to the courts for prosecution.

In each case of a retailer, and of every dealer not a manufacturer or producer, he may, if the party has not been previously complained of in court, issue a notice or warning of any violation of the law relative to the adulteration of food and drugs, and of the offender's liability to prosecution on a repetition of the sale.

11. Should the result obtained by any analyst be questioned in any given case, another analyst shall repeat the analysis, provided a sufficient sum to meet the expense of the analysis be deposited with the Superintendent by any interested party feeling aggrieved, which sum will not be returned unless the second analysis fails to confirm the first in essential particulars.

12. Any appeal from the decision of an analyst shall be filed with the Superintendent, and he shall supervise and control the action of his officers, in executing the law.

13. Where standards of strength, quality or purity are not fixed by the act, the analysts shall present to the Superintendent such standard as in their judgment should be fixed, and the Superintendent shall report the same to the Board for its action. The standards set by the British Society of Public Analysts will be followed as nearly as practicable, until otherwise ordered.

14. The analysts shall occupy such time in the performance of their respective duties as a reasonable compliance with the terms of the statute shall require, and shall be present one hour of each day, at such time of the day and at such place as shall be designated by the Superintendent, to meet the convenience of interested parties and the public.

15. The compensation of the analyst of articles of food shall be at the rate of ——— per annum, and that of the analyst of drugs shall be at the rate of ———

That of the analyst of milk for the eastern shore counties of the State shall be at the rate of ——— per annum, and that of the analyst of the western shore counties shall be at the rate of ——— per annum.

The compensation of each inspector shall be at the rate of ——— per annum.

In order to facilitate the work of the Department the following blanks have been printed:

[STUB.]

....189

Notice sent to..

....

doing business at No...

.... *Street,*..........................

....*Md.*

Character of Sample (state whether an article of Food or a Drug, and specify its nature), ...

....

....

....

How adulterated,..

....

....

....

First or second offence,..

Prosecution, results of,..

....

Name of Analyst, ...

See Acts Relating to the Adulteration of Food and Drinks.

[FORM 1.]

STATE OF MARYLAND.

STATE BOARD OF HEALTH,

Department of Food Adulteration.

....189

You are hereby informed that a sample of.......................... *marked*.., *recently purchased at your place of business, was found on analysis not to conform to the requirement of the Statutes. You are respectfully warned that a repetition of its sale will render you liable to prosecution according to law.*

Very respectfully,

To..

....

Superintendent

[FORM 2.]

STATE OF MARYLAND.

STATE BOARD OF HEALTH,

INSPECTION AND ANALYSIS OF MILK.

Report of...*Analyst.*

No.	Date of Purch'se.	Name of Person from whom Purchased.	Place of Business. Street and Number.	Name of City or Town.	Quantity purchased	Price paid	Result of Analysis.							Remarks.
							Tem-per't'e.	Spe'fic gravity	Fat.	Solids not fat	Total Solids.	Water.	Ash.	

....

Analyst.

....

Collector.

[FORM 3.]

STATE OF MARYLAND.

STATE BOARD OF HEALTH.

INSPECTION AND ANALYSIS OF MILK.

(SAMPLES OF KNOWN PURITY.)

Report of ...., *Analyst.*

1	2	3	4	5	6	7	8							9
							RESULTS OF ANALYSIS.							
No.	Time of Milking.	Where Obtained.	Age of Cow.	Time since Calving.	Breed.	Character of Feed.	Spe'fic gravity	Fat.	Sugar.	Albu-min'ids	Ash.	Total Solids.	Water.	Remarks.
1														
2														
3														
4														
5														
6														

Columns 1, 2, 3, 6 and 7 should be filled by the Collector, at the time and place of milking, the cow producing the samples to be milked in his presence. Each sample should represent a mixed milk, from several animals, unless otherwise directed. Columns 4 and 5 are to be filled only when milk is obtained from single animals.

This blank report should accompany each lot of samples to the analyst, who will please fill columns 8 and 9.

Signed, ...

Analyst.

....189.

[Form 4.]

STATE OF MARYLAND.

STATE BOARD OF HEALTH.

INSPECTION AND ANALYSIS OF FOOD.

Report of ...., *Analyst.*

No.	Date of Purchase.	Character of Sample.	Name of Person from whom Purchased.	Place of Business. Street and Number.	Name of City or Town.	Quantity Purchased.	Price paid.	Result of Analysis.	Remarks.

Signed,

.... *Collector.*

.... *Analyst.*

....189

[FORM 6.]

STATE OF MARYLAND.

STATE BOARD OF HEALTH,

Department of Food Adulteration.

INSPECTION AND ANALYSIS OF FOOD AND DRINKS.

...., 189 .

Dear Sir:

A sample of...

having been deposited by you at this office for analysis, on the.....................*day of*....................................., *I have forwarded the same to* ...., *an analyst of the State Board of Health, and herewith submit his report.*

RESULT OF ANALYSIS.

....

....

....

....

....

....

....

Respectfully yours,

....

Superintendent.

To...

....

[Form 7.]

Health Department. Inspection of Food and Drugs.

No.	Date of Purchase.	Character of Sample.	Name of Seller.	City or Town.	Street and Number.	Quantity Bought.	Price Paid.		Remarks.

[Form 8.]

STATE OF MARYLAND.

STATE BOARD OF HEALTH,

DEPARTMENT OF FOOD ADULTERATION.

Report of Prosecutions for the quarter ending..............................

No.	Date of Entry of Complaint	Name of Party.	Place of Business. Street and Number.	Name of City or Town.	Character of Sample.	Result of Prosecution.	Final Disposal of Case.

..............................189 ....*Inspector*.

CIRCULAR CONCERNING THE LAW TO PREVENT ADULTERATION OF FOOD AND DRINKS.

The State Board of Health is required by an Act of the last Legislature, chapter 604, approved April 8th, 1890, entitled "An Act to provide for the Prevention of the Adulteration of Articles of Food, &c.," to see that the said Act is duly executed. For this purpose it has undertaken the necessary investigations, and it now appeals to the people of the State for information and suggestions that may lead to the correction of wrong practices which the provisions of this law are designed to prevent.

Information and voluntary reports are specially desired concerning the following points:

1. Whatever is known or suspected of the adulteration of milk, condensed or uncondensed.
2. Whatever is known or suspected of adulterations and spurious materials sold as dairy butter.
3. Whatever is known or suspected of adulterated and spurious liquors, sold as beer, wine, whiskey or other beverages.
4. Whatever spurious or adulterated substances are combined with or sold as sugar, coffee, tea, etc.
5. Whatever alkaline and other earthy substance is fraudulently sold as soda and its salts.
6. Whatever artificial mixtures are sold as baking powders, concerning which there is proof of injurious effects on health.
7. Whatever sugars, confections or other mixtures are known or believed to contain *terra alba*, or other earthy and mineral or metallic substances.
8. Whatever is known or suspected of the sale, or preparation for sale, as food for man, of any kind of diseased, corrupted, or unwholesome meat, poultry, game, fish, fruits, vegetables, etc., or of the sale of any diseased, unsound, bruised or half-starved animal, intended for the food of man, or of the sale or prepar-

ation for sale of any sausages, puddings, souse, etc., made of the flesh or blood of any unsound, corrupted or diseased animal, or of any animal not generally recognized as suitable for human food.

9. Whatever substances, mixtures or compounds, recognized or sold as articles of food or drink, which are known or suspected to be in the market for sale, and which are below the normal quantity, quality or strength, or which should not be sold and used as articles of food or beverage, in contravention of the provisions of the aforesaid Act of the General Assembly of Maryland, chapter 604, Laws of 1890.

The State Board of Health earnestly requests that whenever any person is cognizant of a case, or cases, in which there is, or seems to be, evidence of poisoning or injury from the use of any articles of food, beverage, condiment, or the accessories of food or drink, information be immediately given to the Secretary and Executive Officer of the Board, at his office in Baltimore, with the reason for such opinion, and the name of the informer. All such names and information will be treated in confidence, and the Board's action will be so directly responsible that no inconvenience can result to the informer.

This Board desires the fact to be well understood by the public, that the said law originated as a health measure for the protection of the people, as recommended by the said Board, and that its administration will be based upon effectual co-operation with the people, especially honest producers and tradesmen.

On behalf of the State Board of Health.

C. W. CHANCELLOR, M. D.,
Secretary and Superintendent of Department.

Analysis of Water from Well Near Govanstown, Md., Where Typhoid Fever Existed.

[Made by Johns Hopkins University, Baltimore]

	Matter in Solution. Parts per 100,000.	Chlorine. Parts per 100,000.	Nitric Acid. Parts per 100,000.	Sulphuric Acid.	Nitrous Acid. Parts per 100,000.	Free Ammonia. Parts per 1,000,000,	Albuminoid Ammonia. Parts per 1,000,000.	Organic Matter. Parts per 1,000,000.
SAMPLE I— Two half-filled bottles. (Sealed).	13.969	2.552	4.3645	Slightest trace.	.0005	.048	.120	1.114 parts oxygen used.
SAMPLE II— Full green bottle.	24.229	4.983	4.053	Slightest trace.	Slight trace.	.189	.138	1 495 parts oxygen used.
SAMPLE III— Two preserve jars full.	27.38	3.774	3.84	Slightest trace.	.007	.058	.126	2.299 parts oxygen used.

C. PLINY BINGHAM,
J. ELLIOTT GILPIN,
Analysts.

REPORT OF ANALYSIS OF WATER

SENT FROM NORTH EAST, CECIL COUNTY, MD., BY DR. THOMAS A. WORRALL.

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, Feb. 8, 1890.

The water was found to contain—

Solid matter	49.89	parts per	100,000
Chlorine	4 64	" "	100,000
Free Ammonia	.0932	" "	1,000,000
Albuminoid Ammonia	.301	" "	1,000,000

The solid matter was composed mostly of calcium and magnesium carbonates. The quantity of chlorine is larger than we should expect to find in a good water, though in itself it is not evidence that the water is contaminated. The amount of solid matter is also large, but this does not condemn the water. On the other hand, the presence of considerable organic matter is revealed by the amount of free ammonia and albuminoid ammonia obtained. Both of these were found much in excess of the limits of safety as laid down by the most experienced chemists. In my opinion, therefore, the water under consideration should be condemned.

Respectfully submitted,
IRA REMSEN.

JOHNS HOPKINS UNIVERSITY.
BALTIMORE, Feb. 8, 1890.

DR. C. W. CHANCELLOR,
Secretary of State Board of Health.

DEAR SIR—I submit herewith the reports of the chemical examination of waters submitted to me by the State Board of Health, viz: Three samples from Mr. Prentiss, and one from North East, Cecil Co., Md. The three samples from Mr. Prentiss' place are from the same well taken at different times. The analyses show that the water of this well is not fit for drinking purposes. The analysis of the water from North East shows that this also should not be used. Whether it has had anything to do with the outbreak of typhoid fever it is difficult to say, it is at all events open to suspicion.

Yours respectfully,
IRA REMSEN.

REPORT OF ANALYSIS OF WATER

SUBMITTED BY MR. PRENTISS ON ACCOUNT OF THE STATE BOARD OF HEALTH.

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, MD., February 8, 1890.

I submit herewith the report of the analyses made in this labratory of the samples of water submitted by Mr. Prentiss. All the samples contain nitrates in considerable quantity, and more than enough to make it clear that they are contaminated. The free and albuminoid ammonia are both obtained from the waters in suspicious quantities. The evidence furnished by the chemical examination, therefore, leads me to the opinion that the water of the well from which the samples were taken is not, or at least was not, fit for drinking purposes.

Accompanying this please find tabular statement of the results of the analyses prepared by the analysts Messrs. C. Pliny Brigham and J. Elliott Gilpin.

Yours respectfully,
IRA REMSEN.

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, March 22, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health.

DEAR SIR—I enclose a report on the specimen of water submitted by Mr. Prentiss of Govanstown. The water was found to give:

Solid matter	17.69	parts per	100,000.
Chlorine	2.27	" "	100,000.
Free Ammonia	.046	" "	1,000,000.
Albuminoid Ammonia	.072	" "	1,000,000.

On comparing these results with those obtained with the same water some months ago, it is seen that the water is improved. The amount of free ammonia is, however, somewhat high, and this leads me to suspect that there is still some source of contamination operating to a slight extent.

IRA REMSEN.

Johns Hopkins University.
Baltimore, May 13, 1890.

Dr. C. W. Chancellor,

Dear Sir—I inclose a very careful, and undoubtedly reliable, analysis of the Cambridge water by Mr. Pliny Bingham. According to the best authorities the water should be condemned on two grounds; (1) the large amount of matter in solution (47.499 parts per 100,000), (2) the considerable quantities of free and albuminoid ammonia (0.183 and 0.114 parts per 1,000,000). The presence of more than a mere trace of ammonia, indicating as it is thought, recent contamination by decomposing organic matter.

A striking peculiarity of the water is the presence of large quantities of alkaline carbonates (9.246 parts of carbonate of potassium and 24.201 parts of carbonate of sodium, per 100,000 of water; altogether, 33.447 parts of alkaline carbonates per 100.000 of water). The reaction of the water is not at first strikingly alkaline owing to the presence of a large quantity of carbonic acid in the free and "semi-combined" condition. As soon as this excess of carbonic acid is removed by boiling, the water becomes intensely alkaline in its conduct towards the reagents employed for the detection of an alkaline condition in liquids.

It is difficult to account for the presence of such quantities of ammonia and of the carbonates of the alkalies except on the supposition that the water has been in contact with decomposing organic matter.

Very respectfully yours.
H. N. MORSE.

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, May 13, 1890.

DR. MORSE:

DEAR SIR—The result of the analysis of water from Cambridge, Md., is as follows:

Chlorine	.6047	parts	per	100,000
Free Ammonia	.183	"	"	1,000,000
Albuminoid Ammonia	.114	"	"	1,000,000
Hardness	2.650			
Volatile matter	4.276	"	"	100,000
Silica (Si O2)	3.785	"	"	100,000
Calcium (as carbonate)	4.433	"	"	100,000
Magnesium "	.560	"	"	100,000
Potassum "	9.246	"	"	100,000
Sodium "	24.201	"	"	100,00
Sodium (as chloride)	.998	"	"	100,000
	47.499			
Solid matter	47.499	"	"	100,00

After boiling to remove the excess of carbonic acid, the water shows a very strong alkaline reaction.

C. PLINY BINGHAM, *Analyst.*

WATER FROM TALBOT COUNTY, MD.

SENT BY DR. BATEMAN.

Analyst's report on Sample No. 30 (Water), received from Dr. Chancellor, in sealed demijohn, June 10, 1890:

Ammonia, free	0.30	milligrams per litre
" albuminoid	0.22	" " "
Solids, volatile	6.90	grains per gallon
" mineral	21.40	" " "
" total	28.30	" " "
Chlorine	0.70	" " "

Lime, magnesia and iron are present as carbonates. Nitrates and alkaline salts are also present. Notwithstanding the large amount of mineral salts present, the water is soft. The total solid residue blackens, deflagrates and fuses by heat.

The sample is a suspicious water, and is quite as bad as the Cambridge water.

WM. P. TONRY, PH. D.,
Analyst of State Board of Health.

ANALYSIS OF WHISKEY.

CORRESPONDENCE AND ANALYSIS MADE BY PROF. MALLET OF SAMPLES OF WHISKEY, WHICH WERE SUSPECTED OF BEING IMPURE.

UNIVERSITY OF VIRGINIA, July 2, 1890.

DEAR DR. CHANCELLOR:

Your letter of the 1st instant, has just reached me. I did not before know that any quantitative determinations would be required.

My charge for the analysis would be $50 for one sample, and $30 for each additional sample sent at the same time.

Faithfully yours,
J. W. MALLET.

UNIVERSITY OF VIRGINIA, July 12, 1890.

DR. C. W. CHANCELLOR:
Secretary State Board of Health,
Baltimore, Md.

DEAR SIR—The samples of whiskey sent me by you, marked "S. B. of H—C. W. C." reached me safely, the cork and seal had manifestly not been tampered with. I have carefully examined it, and find it to agree satisfactorily, in all essential respects with the description set forth in the United States Pharmacopœia of 1880, save only as to alcoholic strength, which, is a little below the minimum prescribed. It contains 47.69 per cent. of absolute alcohol by volume at 60° F., or 40.32 per cent. by weight. On very slow evaporation of 100 c. c. over a water-bath there was no perceptible smell of fusil oil toward the end of the process. The residue dried at 100° C., weighed but 155 grains and had no distinctly sweet or spicy taste. It was partly soluble as the prescribed amount of cold water, and the solution gave the oak tannin coloration with a ferret salt. 100 c. c. of the whiskey was rendered distinctly alkaline to litmus by 2 c. c. of the standard volumitive solution of soda (40 grains No. HO per litre). I was somewhat inclined to suspect the use of caramel as a coloring agent, but as whiskey loses most of its color by treatment with basic lead antate, this is not probable. The brown substance which forms a part of the residue on evaporation, and which separates to some extent before the evaporation is complete, seems rather to be a phlobaphene accompanying the tannic acid, and, like it, derived from the wood of the casks or barrels.

I believe the sample to represent a sound, wholesome whiskey, though not quite as strong as that called for by the Pharmacopœia.

I am, dear sir, very respectfully yours,
J. W. MALLET,
Prof. of Chemistry.

FOOD AND DRINK INSPECTION.

BALTIMORE, MD., June 10, 1890.

DEAR DOCTOR—In case of Sample No. 5 milk from Dennett's May 20, 1890 specific gravity 1028.1. Solids, 13.70, a sample from the dealer who supplied Dennett shows June 3, 1890, specific gravity 1033. Solids 13.04, a good milk; and a sample received from Dennett's June 9, 1890, shows specific gravity 1032.1. Solids 13.27, a good milk. Note the low specific gravity of Sample No. 5.

In case of Sample No 8, milk from S. P. Zimmerman & Bro., May 22, 1890, gave specific gravity 1029.2, and 11.83 solids. A sample June 9, 1890, from a can just received at Zimmerman's place, and taken in presence of Robert A. Nelson who sends the milk from Monkton shows specific gravity 1031 and 13.27 solids; which would show tampering after the milk was received by Zimmerman & Bro.

Mr. Berry, E. Baltimore street, near the market, coffee and tea dealer called this morning. He says they sell a grade of coffee mixed with chicory at a low price. I referred him to you and he says he will call some day about noon.

Sample of water received. The other samples of wine may be given to bearer, my son.

Respectfully,
WM. P. TONRY,
Chemist.

BALTIMORE, July 10, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health
and Superintendent of Department:

DEAR SIR—The following special report on samples No. 73 and No. 95 is respectfully submitted:

No. 73—Milk sold June 30, 1890, from wagon L. N. 108, at corner of Light and West streets, by Philip McAdams, 1444 William street, Baltimore city, shows, by analysis; acid reaction, specific gravity, 1029.2; 11.21 per cent. total solids, 0.46 per cent. ash, and 8 per cent. by volume of cream, and is adulterated by water.

A notice was mailed by me on June 30 to McAdams, informing him that its sale would render him liable to prosecution.

No. 95—Milk sold July 10, 1890, by the same party, from same wagon, on Light street, between Cross and Hamburg streets, shows, by analysis, acid reaction, specific gravity, 1027.8; 11.24 per cent. total solids, 0.44 per cent. ash, and 7½ per cent. by volume of cream, and is adulterated by water.

What action, if any, shall I take in the matter?

Respectfully,

WM. P. TONRY, PH. D.,

Analyst State Board of Health and Inspector.

Proceedings ordered July 10th, 1890.—C. W. C.

BALTIMORE, July 10, 1890.

Special memoranda of samples Nos. 31, 32, 33, 34 and 35—wine—reported on in June, 1890:

Number of Sample.	Specific Gravity	Total Solids. Per cent.	Alcohol. by weight. Per cent.	Acidity of 250 c.c. Wine=c.c. of normal Soda Solution	Marks on Sample.
No. 31	0.9937	2.50	8.11	42.85 c. c.	H.
No. 32............	0.9900	2.02	10.30	44.00 c. c.	D. C.
No. 33............	0.9900	3.47	15.18	30.85 c. c.	C. S.
No. 34	0.9842	5.12	15.26	35.20 c. c.	D. C.
No. 35	0.9904	9.22	13.20	40.70 c. c.	S. C.
U. S. P. 1880 White Wine	0.9900 to 1.0100	1.50 to 3.00	10.00 to 12.00	15.00 c. c. to 26.00 c. c.	
U. S. P. 1880 Red Wine	0.9890 to 1.0100	1.60 to 3.50	10.00 to 12.00	15.00 c. c. to 26.00 c. c.	

No. 35 contains a small amount of sulphuric acid; Nos. 31, 32, 33 and 34 contain sulphuric acid in considerable excess over what would exist naturally in combination as sulphates.

WM. P. TONRY, PH. D.,

Analyst State Board of Health.

To DR. C. W. CHANCELLOR,

Secretary S. B. H., and Supt. of Dept.

Baltimore, July 24, 1890.

Dr. C. W. Chancellor,
Secretary State Board of Health
and Superintendent of Department.

Dear Sir—The following special report on samples No. 82, and No. 115, is respectfully submitted for such action as you deem proper.

No. 82—Milk sold July 5, 1890, from wagon L. N. 6885, on Howard street., near Centre street., Highland Green Dairy, J. R. Malone, Pennsylvania avenue and Clifton street, city; shows by analysis: Acid reaction, 1027.1 specific gravity, 10.77, total solids, 0.56 ash, and 6 per cent. by volume of cream, showing the sample to have been skimmed and watered.

No. 115—Milk sold July 23, 1890, from wagon L. N. 6885, on Howard street, near Centre street, Highland Green Dairy, J. R. Malone, Pennsylvania avenue and Clifton street, city; Geo. P. Hitchcock, driver of wagon. Shows by analysis: Acid reaction, 1028.8, specific gravity, 11.83 total solids, 0.63 ash and 8 per cent. by volume of cream, showing the sample to have been watered.

A notice was sent July 5, 1890, to J. R. Malone, warning him about the sale of adulterated milk,

Respectfully,
WM. P. TONRY, Ph. D.
Analyst State Board of Health.

Proceedings ordered July 24, 1890.—C. W. C.

Baltimore, July 30, 1890.

Dr. C. W. Chancellor,
Secretary State Board of Health
and Superintendent of Department.

Dear Sir—The following special report on samples No. 75 and No. 116 is respectfully submitted for such action as you may deem proper.

No. 75—Milk, sold July 2, 1890, from wagon L. N. 4254, on Charles street, north of Barre street, Ashland Dairy, Tom Hoye, 1032 West Lombard street, Baltimore city, shows by analysis: Acid reaction, 1029.7 specific gravity, 11.17 total solids, 0.53 ash, and 6 per cent. by volume of cream, showing the milk to have been adulterated by water.

Warning notice was mailed July 2, 1890.

Sample No. 116, Milk sold July 8, 29, 1890, from wagon L. N. 4254, on Hughes street, between Light and William streets, by Tom Hoye, who was driving. The analysis shows: Slightly acid, almost neutral reaction, 1030.5 specific gravity, 11.34 total solids, 0.65 ash, and 6 per cent. by volume of cream. The sample is a skim milk adulterated and colored. The sample is from the Ashland Dairy, which the driver, Tom Hoye, says he sold out to L. W. Reinhardt, Medford, Western Maryland Railroad, on the day after he received the notice from the State Board of Health about sample No. 75. Respectfully,

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

Proceedings ordered July 30, 1890.—C. W. C.

BALTIMORE, August 1, 1890.

Special report on sample of "Spring Dale Pure Rye Whiskey," purchased by myself, July 5, 1890, from H. Rosenheim & Son, 413 West Baltimore street, city.

Sample number.	Specific Gravity	Alcohol by volume.	Residue by evaporation of 100 c. c.	Acidity of 100 c. c.	Color of dissolved residue by Ferric Chloride.
83	.9485	43.20 p. ct.	1.28 grm.	0.75 c. c.	Brown.
U. S. P. 1880.	.917 to .930	50 per ct. to 58 per ct.	Not over 0.25 grm.	2 c. c. or less.	Light Green.

Baltimore, August 1, 1890.

Special report on two samples of wine received July 14, 1890, from Dr. Chancellor.

Sample number.	Marks on sample.	Specific Gravity.	Alcohol by weight.	Residue (per ct.)	Acidity—Soda sol. required to neut. 250 c. c.
109	Cx	.9953	7.60 per ct.	2.18 p. ct.	37. c. c.
10	C No. 2.	.9961	8.71 per ct.	2.71 p. ct.	72. c. c.
U. S. P. 1880.		.989 to 1.010	10. per ct. to 12. per ct.	1.6 per ct. to 3.5 per ct.	15 c. c. to 26 c. c.

Baltimore, August 1, 1890.

Special Report on two samples of brandy received July 14, 1890, from Dr. Chancellor:

Sample Number	Marks on Sample.	Specific Gravity.	Alcohol by volume. Per cent.	Residue from 100 c. c. in grammes.	Acidity—Soda solution required to neutralize 250 c. c.	Reaction of dissolved residue by Ferric Chlorine.
111	A 1874	.9272	46.50	1.41	1.2 c. c.	Brown color
112	B 1870	.9327	53.57	1.76	1.34 c. c.	Brown color
U.S.P. 1880	....	.9250 to .9410	46.00 to 55.00	Not over 0.25	Not over 3 c. c.	Light green

BALTIMORE, August 1, 1890.

Special report on samples of milk obtained at Maryland Central Depot, Baltimore, as shipped by eight members of the Maryland Central Dairy Association:

NAMES.	Specific Gravity	Total Solids.	Ash.	Cream.	When Collected.
Clayton, J. W. B..........	1032.3	13.15	0.42	9	July 12
Hoopes, J. T.	1032.2	13.91	0.48	14	July 12
Street, J. P................	1032.4	13.72	0.43	10	July 12
Street, A. T................	1032.2	12.76	0.48	16	July 14
Hollingsworth, D. P..... ..	1030.4	15.23	0 37	28 ?	July 14
Wilson, Wm. H............	1031.3	13.07	0 39	12	July 14
Macatee, H	1032.1	14.47	0.60	16	July 21
Hanway, Wm. E...........	1030.6	13 82	0 59	9	July 22

The sample from D. P. Hollingsworth is looked upon with the suspicion that there was an admixture of cream with the sample over and above that which naturally belongs to it.

If the other members of the Association will forward the names of those to whom they ship, they will facilitate the collection of their samples.

BALTIMORE, Aug., 6, 1890.

Special report on sample of water received August 2, 1890, in sealed demijohn from Dr. Chancellor. Sample No 126:

Ammonia free........................	0.04 milligram per litre
" albuminoid..................	0.10 " " "
Solids, volatile	1.70 grains per gallon
" mineral	4.50 " " "
" total....	6.20 " " "
Chlorine..............................	0.30 " " "

WM. P. TONRY, PH. D.,
Analyst of State Board of Health.

BALTIMORE, August 11, 1890.

Special report on No. 132, milk obtained August 7th, 1890, at Camden Station, from 3 cans shipped by J. E. Gaither, Gaither Siding, to E. R. Bond, 1319 Hollins street, shows: Acid reaction, 1031.2 specific gravity, 13.09 solids, 0.57 ash, and 137. cream. The sample is a good milk and is above standard. No. 124, milk from Bond, who asks for the analysis of Gaither's milk, shows, August 2, 1890: Acid reaction, 1028.8 specific gravity, 12.61 solids, 0.49 ash, and 14 per cent. of cream. The sample was watered and he was notified August 2, 1890.

WM. P. TONRY, PH. D.,
Analyst of State Board of Health.

BALTIMORE, Aug. 12, 1890.

Special report on sample of water, received in sealed demijohn, August 8, 1890, from Dr. Chancellor.

Ammonia, free	00.12	miligram	per	litre.
" albuminoid	00.10	"	"	"
Solids, volatile	3.36	grains	per	gallon.
" mineral	17.08	"	"	"
" total	20.44	"	"	"
Chlorine	00.25	"	"	"

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, August 14, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health
and Superintendent of Department.

DEAR SIR—I have just mailed a notice to B. F. Darbie, a copy of which is inclosed. I also inclose to you a copy of the appearance under the microscope of his two samples Nos. 129 and 134 on account of which the notice was sent. The analyses of these samples are as follows:

Number	When Obtained.	Reaction.	Specific Gravity.	Solids.	Ash.	Cream.	Character of the Sample.
129	August 6, 1890.	Neutral.	1030.3	15.24	0.70	12	Impure x M
134	August 7, 1890.	Acid.	1031.4	13.32	0.58	11	Impure x M
2	May 19, 1890, from his store.	Slight acid. Nearly neutral.	1028.6	14.77	0.69	12	Watered.
59	June, 21, 1890. Delivered in bottles.	Slight acid.	1032.5	13.37	0.58	14	O. K.
113	July 21, 1890.	Acid.	1032.1	14.47	0.60	16	O. K.

Nos. 129 and 134 were delivered by Darbie to the Maryland General Hospital for the use of the sick in the hospital proper and of the infants in the lying-in department. No. 2 I purchased myself at Darbie's store, and No. 59 was obtained on the street from wagons that delivered in bottles. Three out of these four samples are bad. No. 129 has the larger amount of solids and of ash of any sample yet examined, too high, indeed not to point directly, in a *neutral* sample, to the use of a preservative. No. 113, in red ink, is from H. Macatee, Pylesville, July 21, 1890, per Maryland Central Railroad to Darbie. I send these memoranda to you, as you will want to talk understandingly, should Darbie call on you after receiving the notice.

Respectfully,
WM. P. TONRY, PH. D.,
Analyst State Board of Health.

The Grand Jury to-day had up the cases of McAdams, Malone and Hoye.

BALTIMORE, August 20, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health
and Superintendent of Department.

DEAR SIR—The following special report on samples Nos. 130 and 147 is respectfully submitted for such action as you deem proper. No. 130 milk, sold August 6, 1890, from wagon, L. N. 7823 on Bank street, near Washington street, by Geo. Weinbeck, shows by analysis: Acid reaction, 1028.5 specific gravity, 9.74 total solids, 0.47 ash and no cream. The milk was skimmed and watered.

Notice was sent to him on August 6, 1890.

No. 147 milk, sold August 19, from wagon, L. N. 7823, on S. Washington street, near Eastern avenue, by Geo. Weinbeck shows by analysis: Acid reaction, 1027.5 specific gravity, 10.58 total solids, 0.71 ash, and 4 per cent. of cream. The milk was skimmed and watered. George Weinbeck, on both occasions was driving the wagon, and sold the milk, he is the proprietor of the dairy and resides at 710 Third street, Highlandtown.

Respectfully,
WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

Institute proceedings in the above case.

C. W. CHANCELLOR, M. D.,
Secretary State Board of Health.

Baltimore, August 21, 1890.

Special report on sample No. 150. Water received from Dr. Chancellor, August 19, 1890, in stone jugs marked from Dr. T. A. Worrall.

Ammonia, free	00.04	milligram	per	litre
“ albuminoid	00.09	“	“	“
Solids, volatile	2.00	grains	per	gallon
‘ mineral	3·20	“	“	“
“ Total	5.20	“	“	“
Chlorine	0.40	“	“	“

The sample may be classed as good, though the albuminoid ammonia is a little high.

WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

Baltimore, Sept. 13, 1890.

Special report on Samples of Milk collected in Cumberland, Md., on September 2 and 3, 1890.

Dr. C. W. Chancellor,
Secretary State Board of Health
and Superintendent of Department.

Dear Sir—In my visit to Cumberland, Md., on the 2 and 3 inst., I collected eleven samples of milk. Nine of the samples, viz., Nos. 173 to 181 inclusive, were collected from wagons on the streets, and two samples, viz., Nos. 182 and 183 were obtained at the Queen City hotel, from Mr. Geo. D. Deshield, as samples of the milk delivered to the hotel. The accompanying table gives the results of the analyses, Sample 179 was a skimmed milk, and sample 183 a watered milk, as shown by specific gravity and total solid figures.

Samples from Naughton, Llewllyn and Hite with 14, 12, and 10 per cent. of cream, are the best. Footer's will pass with 8 per cent. of cream, while Finans begins to be low with 7 per cent. Flickenstein's with only 6 per cent. of cream, and Stagmaers and Fisher's with only 5 per cent. can not be regarded without suspicion of having been deprived, by some means of part of their cream, although they come up to the standard as to specific gravity and solids. Dougherty's with only 4 per cent. of cream, is as to specific gravity below the standard. The last mentioned five samples were very sickly looking samples when obtained.

One lot of rotten bananas, belonging to James Carson, 45 Baltimore street, and exposed for sale, were condemned and ordered to be destroyed.

Respectfully,
WM. P. TONRY, Ph. D.,
Analyst and Inspector State Board of Health.

Baltimore, September 20, 1890.

Special report on sample of water received September 15, 1890, by express, from Dr. W. Frank Hines, Chestertown, Md., shows by analysis:

Ammonia, free	00.02 milligram per litre
" albuminoid	00.12 " " "
Solids, volatile	2.00 grains per gallon
" mineral	7.00 " " "
" total	9 00 " " "
Chlorine	1.00 " " "

Character of the sample, as a drinking water, is suspicious.

WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

Baltimore, October 9, 1890.

Special report on sample No. 193, water received by express from Mt. Airy, September 22, 1890, and marked "from W. H. Wood of H." shows:

Ammonia, free	00.00	milligrams per litre
" albuminoid	00.03	" " "
Solids, volatile	2 00	grains per gallon
" mineral	2.50	" " "
" total	4.50	" " "
Chlorine	0.30	" " "

Were it not for the blackening and deflagration shown by the evaporated residue of this sample, I would mark it as good, but as it is, it will be safer to consider the sample as suspicious.

WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

Baltimore, October 15, 1890.

Special report on sample No. 204, water received from Chestertown, Md., and marked "sample No. 2, as sent by Dr. W. Frank Hines," gives the following results:

Ammonia, free	.00	milligram per litre
" albuminoid	.08	" " "
Solids, volatile	2.00	grains per gallon
Solids, mineral	6.00	" "
" total	8.00	" "
Chlorine	.70	" "

As there is no deflagration or blackening of the residue in burning, the sample, with the above figures, may be passed as good; but it is hardly safe to regard it as entirely free from suspicion.

WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

Baltimore. Md., October 15, 1890.

Dr. C. W. Chancellor:

Dear Sir—The following data of determinations made by myself for use in my lecture to the class at the Baltimore Medical College may be of interest to you as regards the conditions of filtered and unfiltered water, as shown by samples of Baltimore City water from Gunpowder supply, unfiltered, filtered through bone black and filtered through polarite.

	Unfiltered.	Filtered through Bone Black.	Filtered through "Polarite."
Free Ammonia	.02	.02	.00
Albuminoid Ammonia	.22	.11	.04
Volatile solids	3.00	2.34	1.66
Mineral "	2.66	2.66	3.33
Total "	5.66	5.00	4.99
Chlorine	.30	.30	.30
Character of the sample	Bad.	Suspicious.	Good.

The sample of city water and the sample filtered through polarite were taken at the same time and place, and the sample filtered through bone black was obtained three blocks away, and within half an hour. Probably one cause why the unfiltered city water is so impure is due to the fact, as shown by the records of the Signal Service Office in this city, that during the thirteen days previous to the collection of the sample the total rainfall was 1.71 inches, and rain fell on seven of the thirteen days, as follows: .01, .33, .60, .00, .00, .41, .25, .00, .00, .00, trans., .06, .05.

The unfiltered city water was murky, while both filtered samples were perfectly clear.

Respectfully,

WM. P. TONRY, PH. D., *Chemist.*

BALTIMORE, October 17, 1891.

Special report on sample of water, drawn by myself, October 10, 1891, from pump near railroad at Jessups Station on Baltimore and Ohio Railroad.

Ammonia, free	00.26	milligram per litre
" albuminoid	00.08	" " "
Solids, volatile	9.00	grains per gallon
" mineral	12.00	" " "
" total	21.00	" " "
Chlorine	5.00	" " "

Character of the sample as a drinking water—bad and unfit for use.

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, December 2, 1890.

Special report No. 274. Milk. One pint brought by Dr. Piper, President State Board of Health gives the following results: Very slightly acid—almost neutral. Specific gravity at 60° F., 1035.2, total solids, 19.88, ash 0.75, cream, (emultionised fat), 58 per cent. by volume.

The sample is abnormal, all the figures are higher than are found in a good milk, and even higher than I have obtained in any sample, good or bad, thus far examined for the State Board of Health.

Under the microscope the fat appears to have been, to a great extent emultionised, and to be held together, as is the case when mucus is present. Some few clots of blood are also present. The sample is abnormal and not fit for use.

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, December 12, 1890.

Sample No. 283, milk received from Dr. Piper, President State Board of Health, on December 10, 1890, yields: Reaction acid, specific gravity 1037, total solids 18.79, ash 0.76, cream 40 per cent.

Specific gravity, solids and cream are abnormally high.

Microscope shows the fat globules in too great a contrast as to size, some being very large, and others very small.

The sample is not normal, and its use, in its present condition, can not be recommended.

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, October 17, 1891.

DR. C. W. CHANCELLOR,
*Secretary State Board of Health
and Superintendent of Department.*

DEAR SIR—The following special report on sample No. 338, milk sold, September 29, 1891, on St. Paul street, corner of Centre street, from wagon 687, Rockvale Dairy, John Coffey, proprietor and driver, No. 513 North Paca street, is respectfully submitted for such action as you may direct.

The sample shows by analysis—Acid reaction, 1027.5; specific gravity, 12.78 per cent. solids and 0.58 per cent. ash. It had been adulterated by water. The microscopic examination showed milk from a diseased cow or cows.

Respectfully,
WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, October 17, 1891.

Special report on one basket of grapes, marked "from New York," purchased in Centre Market, October 3, 1891, there was no mineral poison either inside or on the outside of the grapes.

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

No.	Sample from	Reaction.	1029 or over.	12 per cent. or over.	Ash.	Cream.	Remarks.
			Sp. Gr.	Solids.			
173	Thos Footer, Sr....	Alk.	1032.1	13 23	0.51	8	
174	H. M. Hite	Alk.	1031.4	12.95	0 62	10	
175	J. W. Llewellyn.....	Neut.	1031.9	13.79	0.64	12	
176	James Finan.......	Neut.	1031.7	13.58	0.64	7	
177	Leonard Stagmaer..	Alk.	1032.4	13.61	0.68	5	
178	Wm. Fisher........	Alk.	1033.8	13 50	0 71	5	
179	M. H. Dougherty...	Acid.	1028.7	12.84	0.64	4	Skimmed.
180	Adam Fleckenstein.	Neut.	1032.0	12 10	0.73	6	
181	M. Naughton, Sr....	Acid.	1032 9	14.14	0.64	14	
182	Q.C.H., marked from N. Naughton, Jr..	Acid.	1032.0	14.59	0.66	14	
183	Q.C.H., marked from Mrs. Wemple.....	Acid.	1029 5	11.53	0.51	9	Watered.

LETTER FROM THOS. FOOTER & SON, ACME DAIRY.

CUMBERLAND, MD, September 13, 1890.

PROF. TONRY, *Analyst State Board of Health.*

DEAR SIR—Yours of the 13, received, for which please accept thanks; I have been away buying registered cattle or would have wrote you sooner.

While our milk is higher in solids than is required in ,I think, any of the States I am disappointed in only 8 per cent of cream. Our milk is mostly put up in bottles, but a part is sold from can, one cent cheaper, you got your sample at the commencement of the route, and it is thought that those who get the last from the can get the most cream. At that time we were trying feeding a part ration of brewers' grains to the cows, but have since abandoned it. Prof. Stewart says these grains properly fed with other grains is healthy. I spoke with Dr. Chancellor on that subject at the Queen City Hotel sometime ago. We believe that grains make thin milk, however.

A cow will at times give alkaline milk but it would be unusual for a herd of twenty to do so. The slight alkaline showing you speak of may be due to rinsing our utensils with a solution of Carbonate of Potash when cleaning them. This mode was recommended in "Country Gentlemen," some months ago by Henry Stewart, author of a work on dairying, and considered our best authority. We would not, however, use any alkali for the purpose of preserving the milk. We are trying to build up a model dairy, but have to compete with the scores of people in town who keep cows in filthy pens and feed their cows on dirt and slops.

Any information or suggestion from you or a visit at any time would be pleasing to us. We also invite all our customers to visit us at any time to see our clean method and management, something no other dairy in this neighborhood dare do.

Very respectfully,
THOS. FOOTER & SON,
Proprietors Acme Dairy.

SPECIAL ANALYSES MADE BY JOHNS HOPKINS UNIVERSITY.

STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY.

W. T. COULEHAN, Esq.,
Chairman Council Committee on Water,
Cumberland, Md.

DEAR SIR—I have the honor to submit herewith a report of the special analyses of samples of water from Cumberland, made by the Johns Hopkins University.

The result is somewhat puzzling, in this, that the water above the proposed intake is worse than at the point itself. Possibly, it may have been taken at a time when recent floods had dislodged and brought down an unusual quantity of organic matter from above; and, again, the sample may have been taken from a distance more or less remote from the river bank, than the sample taken at the intake. These are circumstances which require to be noted.

The analyses show that No. 1 and No. 3 are absolutely to be condemned by the rules of Wanklyn, while No. 2, the best of these samples, is extremely suspicious, and probably dangerous. The relatively small quantities of Chlorine (as compared with Albuminoid Ammonia) appear to indicate that a large proportion of the contamination is due to vegetable matter.

A good water for drinking purposes should not contain more than

Free Ammonia..................	.01 or .02	milligrammes per litre
Albuminoid Ammonia	.06 or .08	" " "

Water which possesses the following amounts of the two ammonias is classed amongst the suspicious waters.

Free Ammonia..................	.03 or .05	milligrammes per litre
Albuminoid Ammonia...........	.10 or .12	" " "

Respectfully yours,

C. W. CHANCELLOR, M. D.,

Secretary State Board of Health.

ANALYSIS OF WATER FROM CUMBERLAND, BY JOHNS HOPKINS UNIVERSITY.

	Parts per Hundred Thousand.				Parts per Million.
	Solids.	Nitrates.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.
No. 1—Above run	8.965	Traces.	0.141	0.13	0.165
No 2—Proposed end of pipe.....	7.595	Traces.	0.123	0.10	0.13
No. 3—Above the wharf	8.32	Traces.	0.123	0.11	0.17

The quantities of oxygen required for the oxydation of organic matters were: 3.3 parts per 1,000,000 for No. 1, 1.9 for No. 2, and 3.5 for No. 3.

REPORTS OF PROF. TONRY, ANALYST.

Baltimore, May 31, 1890.

Chas. W. Chancellor, M. D.,
Secretary of State Board of Health
and Superintendent of Department
of Food and Drink Inspection:

Dear Sir—I began the analytical and inspection work for the Department on the 16th of May, and for the balance of the month ending with May 31, and obtained eighteen samples of milk, one sample of whiskey, and one sample of wine. The wine is a good article, but contains a rather large percentage of alcohol, 13.10 per cent. by volume, for a California wine. In regard to the sample of whiskey, the murky residue, which, in sealed bottle, accompanies this report, and which is one-third of the quantity from which the alcohol was distilled off, will sufficiently show the impure character of the sample, but a more detailed report on this sample will be made.

Of the milk samples, Nos. 18 and 19 were obtained from a farm in this State, from which the milk is not sold. The cream in the lower of the two makes a better showing than most of the city samples. No. 16 was sold as "good milk, but not the best," and at less than the ordinary price charged for milk. It is a skimmed milk. All the other samples of milk were sold without comment. Six of them are marked adulterated.

There is no law in this State fixing a standard for milk. The New Jersey law says that milk containing less than 12 per cent. of milk solids shall be deemed to be adulterated; and an extended series of observations by different observers show that the specific gravity of an unmanipulated milk will rarely, if ever, fall below 1029. I have adopted these figures in judging of the milk examined, viz., 12 per cent., or over, of total milk solids, and a specific gravity of not less than 1029.

Respectfully,

WM. P. TONRY, Ph. D.,

Analyst and Inspector.

ANALYST'S AND INSPECTOR'S REPORT FOR SIXTEEN DAYS OF THE MONTH ENDING MAY 31, 1890.

No.	Specific Gravity.	Total Solids.	Ash.	Cream by Volume.	Character of Sample.
2	1028.6	14.77	.69	12	
3	1027.8	12.64	.67	10½	Adulterated.
4	1030.6	13.70	.67	8	
5	1028.1	13.70	.64	8	Adulterated x.
6	1032.2	13.29	.57	8	Adulterated. Microscopic foreign matter.
7	1031.0	13.81	.58	14	
8	1029.2	11.83	.56	8	Adulterated.
9	1023.3	9.90	.43	8	Adulterated.
10	1030.4	14.90	.49	9	
11	1028.6	11.78	.42	8	Adulterated.
12	1030.4	13.06	.49	10	
13	1029.3	12.90	.45	7?	
14	1030.0	12.17	.56	8	
15	1029.3	11.41	.55	2	Adulterated.
16	1031.6	9.59	.52	4	Skim milk sold as not the best.
17	1030.0	13.57	.68	9	
18	1030.7	14.91	.73	16	
19	1031.0	13.33	.70	12	

Samples of food collected during the month of May (16th to 31st)—Milk, 18.

Drinks—Whiskey, 1, impure; wine, 1, good, 13.10 per cent. alcohol, specific gravity 0.987, reaction acid, total solids 2.10 per cent.

Names of cities and towns visited during the month —None outside of Baltimore City.

WM. P. TONRY, Ph. D.,

Analyst and Inspector.

Baltimore, Md., May 31, 1890.

Baltimore, Md., June 28, 1890.

Chas. W. Chancellor, M. D.,
Secretary State Board of Health
and Superintendent of Department
of Food and Drink Inspection:

Dear Sir—As Inspector of this Department I have collected since May 16, 1890, sixty samples of milk, as follows: Sixteen from wagons on the street, eleven from stores, three from city-kept cows, two from country cows where milk is not sold, thirteen at Calvert Station, eleven at Hillen Station, two at Maryland Central Station. The milk samples at the railroad stations were taken on the arrival of the trains and before removed by the consignee from the platform to his wagon. I had no difficulty in collecting the samples, and have been treated with uniform courtesy by all with whom I came in contact. As far as the milkmen are concerned, the city vendor and the country shippers, whom I saw at the depots, say that the law is a good one, that it should have been passed long ago, and they hope it will be strictly and impartially enforced. I also collected one sample of vinegar, making sixty-one samples collected by myself.

As analyst, in addition to the sixty-one samples collected by myself, I received two samples of whiskey, six samples of wine, one sample of water and two samples of crab meat, making seventy-two samples received to date.

Of the sixty samples of milk examined, eight were watered, five were skimmed, three were skimmed and watered, five showed bad results under the microscope, one was stale, and one was otherwise manipulated—a total of twenty-three out of sixty samples of milk, or thirty-eight and one-third per cent. of bad or sophisticated milk sold or received in this city. Of the eleven samples of milk collected from the shippers' cars as they arrived at Hillen Station, three were good; the other eight were either skimmed or watered, or both, or showed by the microscope a condition which would call for an investigation at the home of the producer.

Neither sample of whiskey received, corresponds to the standard of the pharmacopœia, and cannot, therefore, be considered as pure. Chapter IV of the General Regulations of the Custom Service, issued by the Treasury Department for instruction to its analysts, says, in article 508, "All imported drugs, medicines and medicinal preparations are to be tested in reference to strength and purity by the standard established by the United States, Edinburgh, London, French and German Pharmacopœias and Dispensatories." With the amount of work that must be done by the analyst under the present circumstances, it is impossible, in such cases as drugs, medicinal preparations, wines, whiskeys, etc., for the analyst to do more than determine whether or not the articles come up to the standard required by the pharmacopœia and dispensatory. If a full or complete determination of all the constituents of an article is deemed advisable by the Board or Executive Officer, it must be understood that it can be done only by the exclusion of other work for the time being.

Of the five samples of wine received this month, Nos. 31, 32, 33, and 34, are classed as adulterated on account of the amount of Sulphuric Acid which they contain. No. 33 contains only a trace of Sulphuric Acid while Nos. 31, 32, 33, 34, contain such a large amount as to point to plastering, sulphuring, or some other of the methods known to the trade by which Sulphuric acid, free or in combination, finds its way artificially into wines. All the samples of wine show a very acid reaction. In Nos. 33, 34, 35, the alcohol is high. No. 35. judging from the figures, is an article in which fermentation was stopped by the addition of alcohol. It is classed as sophisticated.

As a resume of the analytical work done to date 100 per cent. of the whiskey, 83⅓ per cent. of the wine, and 38⅓ per cent of the milk samples are adulterated.

Respectfully,
WM. P. TONRY,
Analyst State Board of Health.

BALTIMORE, August 1, 1890.

C. W. CHANCELLOR, M. D.,
Secretary State Board of Health
and Superintendent of Department
of Food and Drink Inspection:

DEAR SIR—The work of the analyst for July, 1890, embraces fifty analyses, viz., forty-four of milk, one of whiskey, two of wine, two of brandy, and one of vinegar. Of the forty-four samples of milk, eighteen were collected in the city from wagons on their delivery routes; and of these eighteen samples, nine were watered, one was skimmed, two were skimmed and watered, one was skimmed and otherwise adulterated, and five that came up to the standard as to specific gravity and total solids showed evidence of having been manipulated, thus showing that not one of the eighteen samples collected in the city for the past month was an undoubtedly pure milk. Of milk as it arrived in the city and before it passed into the hands of the city dealer, twenty-six samples were collected, as follows—twelve at the Maryland Central Depot, nine at Fulton Station, and five at Camden Station. Of these twenty-six samples, all but one came up to the standard as to solids and specific gravity, and that one was skimmed. One sample showed an excess of cream, and one sample showed carelessness in milking or injury to the cow, leaving twenty-three samples of undoubtedly pure milk out of the twenty-six collected as they came from the country.

As directed by the Board, three arrests of city dairymen were made this month, viz., Philip McAdams, 1444 William street, on July 11, 1890; J. R. Malone, Highland Green Dairy, Pennsylvania avenue and Clifton street, on July 24, 1890, and Tom Hoye, Ashland Dairy, 1032 West Lombard street, on July 30, 1890. Each one of these cases has been sent to the Grand Jury.

Cream and skim milk are shipped to the city in the same kind of cans as the whole milk, and generally without any mark whatsoever as to the character of the contents of the cans. Complaint has been made at one of the depots of this practice, and the Department is asked to put a stop to it.

The sample of vinegar (No. 121) shows a specific gravity of 1032 4, with 2.30 per cent. total solids, and a strength equal to 45.78 grains crystallized bi-carbonate potash per troy ounce. It is free from sulphuric acid, and is a pure cider vinegar. Neither of the samples of the wine or brandy agree in every particular with the standard of the pharmacopœia, nor does the sample of whiskey, as is shown in the accompanying special reports.

Respectfully,

WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, MD., October 9, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health
and Superintendent of Department:

DEAR SIR—The work of the analyst for the month of September embraces twenty-two samples of milk, two samples of water, and one of beer—the latter not yet reported on. Eleven samples of milk were collected by me in Cumberland, Md., and results reported in special report September 13, 1890. Eleven samples of milk were collected in this city, seven of which were from city dealers, and of these seven, one was adulterated with water. Four samples were collected at President-street Depot, and of the four one was adulterated by skimming. The case of Mrs. Holyer, 1028 North Ann street, Ernie Dairy, who received a notice August 11, 1890, for selling a watered milk (acid 1026.1—10.74), and asked you to investigate her shipper, has been attended to, and a sample from five cans taken at Calvert Station from N. E. Ensor, the shipper, shows a good milk (acid 1030.5—13.72).

Mrs. Smith, Calvert Dairy, corner of North Calvert and Monument streets, received a notice for selling a watered milk. About fifty of the students of Loyola College frequent this place during recess, and buy milk for their lunch, and the sample of milk obtained was below standard, both as to specific gravity and as to solids. Mrs. Smith would give no definite information as to where her shipper's milk could be obtained.

I visited Lutherville, as directed by you, on the 27th of September, in reference to Duering's case. I found his pig-pen in good condition, but his barn-yard still drains directly into Roland Run, and his four cows are restricted to a small space immediately on the bank of the run. The condition of his place, on the 27th of September, was such as to give more pollution to Roland Run than at the time of my former visit.

The case of Henrietta Fineburg, who was charged in the indictment with "offering for sale diseased, corrupted and unwholesome provisions, to wit, fruit," was tried in the Criminal Court of this city on October 1st, 1890. I was called as a witness in the case, as I saw the rotten fruit on her stand. The actual charge in the indictment—offering for sale—seems to have been completely ignored, and the attention of the jury turned to an actual sale, which was not proven, and a verdict of not guilty was rendered.

Special reports have been made on the samples of water.

Respectfully,

WM. P. TONRY, PH. D.,

Analyst and Inspector State Board of Health.

Baltimore, Md., Sept. 1, 1890.

Dr. C. W. Chancellor,
Secretary State Board of Health
and Superintendent of Department:

Dear Sir—The work of the analyst for the month of August 1890, embraces 3 analyses of water, and the collection and analyses of 48 samples of milk. Special reports have been made on the samples of water.

Of the 48 samples of milk, 20 were good, 11 were watered, 5 were skimmed, 6 were skimmed and watered, and 6 while coming up to the standard as to solids and specific gravity, showed an unhealthy condition under the microscope, or such a low percentage of cream as to point to swill fed cows or very close skimming. 58⅓ per cent. of these samples are bad.

Of the 48 samples of milk collected the past month, 21 samples were collected east of Jones Falls; and of these 21 samples, 5 were good, 7 were watered, 3 skimmed, 4 were skimmed and watered, and 2 are probably from swill fed cows. 76,2.10 per cent. of the milk samples collected in East Baltimore are bad. Two of these samples had no cream at all, one had only 2½ per cent., three had 4 per cent., six had 7 per cent., and 2 had only 8 per cent; of those that had over 8 per cent, some had been found deficient last month and had received warning notice.

Samples taken this month from dealers who received warning notice last month, showed milk up to the standard in every case, except one, and in that case suit was entered, and the party has been presented by the Grand Jury.

Only one of the samples of milk taken last month at the railroad depots was found adulterated, and that came from Sykesville, over the Baltimore and Ohio Railroad.

Respectfully,

WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

BALTIMORE, MD., November 5, 1890.

DR. C. W. CHANCELLOR,
Secretary State Board of Health
and Superintendent of Department:

DEAR SIR—This report of the analyst for the month of October, 1890, embraces two analyses of water, Nos. 203 and 204, which have been specially reported upon, on October 9th and 15th, one sample of rock candy and forty-seven samples of milk.

Of the forty-seven samples of milk, seventeen are from city dealers serving their routes, and thirty are from the country, taken at the railroad depots, viz., ten from Hillen Station, ten from Calvert Station, five from President-street Station, and five from Camden Station. Five samples of milk from the country, viz., one from Calvert, one from Camden, and three from President-street Station, were found to be adulterated with water. Of the seventeen city samples, only one was found to be adulterated, and that with water.

The rock candy, sample No. 205, received for examination, is composed of cane and grape sugar. There are no barytes present, nor is there any alum, which it was surmised the sample contained. There is only a trace of sulphuric acid present, not more than could be accounted for as coming from the water used in dissolving the sugar before it was crystallized on the string. The sample is not adulterated. In reference to the statement made that the candy had blistered the lips of some persons who had eaten some of it, I beg leave to state that I have eaten a quarter of a pound of the candy, and have noticed no such effect.

The case of McAdams, for selling adulterated milk, was tried on October 27th, 1890, before a jury in the Criminal Court of this city, Judge Duffy presiding, and State's Attorney Kerr for the State.

McAdams sold adulterated milk on June 30th and July 10th. The trial was for the sale on the 30th alone. McAdams, on the witness stand, admitted the sale, and that he put ice in the milk-can with the milk on the day of the sale. He testified that in so doing he did not know that he was adulterating the milk, but considered the addition of ice to the milk itself as necessary to prevent the milk from churning, since he had no facilities for putting ice outside the can. He also testified that some of his customers were aware of the fact that he put ice in the milk, and that the price of ice, at the time, was higher than the price of milk.

The jury brought in a sealed verdict of not guilty, on the 28th of October.

Three other cases for the sale of adulterated milk were postponed at the request of defendants.

Respectfully,

WM. P. TONRY, Ph. D.,

Analyst State Board of Health.

Baltimore, Md., November 29th, 1890.

C. W. Chancellor, M. D.,

Secretary State Board of Health

and Superintendent of Department:

Dear Sir—Twenty-five analyses of milk were made this month by the analyst, of which ten were collected at depots and fifteen from city dealers serving their routes.

Of the five samples collected at President-street Station while the milk was yet on the cars, two were skimmed milk, which, however, came up to the present standard, and three with specific gravities of 1025.8, 1026.4 and 1028.5 instead of the minimum required, viz., 1029, were watered.

One sample collected at Calvert Station, shipped November 26th, by O. M. Hutchins, Monkton, was a watered sample, with 1027.6 specific gravity. This same party shipped on October 28th, 1890, a watered milk with a specific gravity of 1026.6, and a notice was sent to him, which seems to have been disregarded.

Of the country milk collected this month, only 40 per cent. was good, while the city milk shows 67 per cent. of good samples.

Of the city samples, one was skimmed, four were watered and ten were good.

My attention has been called to the character of the ice manufactured by artificial process—to so-called fruit jellies in which salicylic acid is said to be used, and to an article marked and billed as "Cider Juice," which is being put upon this market as a cider.

Respectfully,
WM. P. TONRY, PH. D.,
Analyst State Board of Health.

BALTIMORE, MD., Jan. 3, 1891.

DR. C. W. CHANCELLOR,
Secretary State Board of Health
and Superintendent of Department.

DEAR SIR—The work done by the analyst during the month of Dec. 1890, embraces twenty samples of milk, two of wine, two of cheese, and one of water.

Of the twenty samples of milk, eleven were good, six were watered, one was skimmed, and two were abnormal and from a diseased cow. All these samples, except the two abnormal samples, are from city dealers.

The sample of water, No. 275, from Cox's Station Md., drawn by Dr. Robert Diggs, gave the following results:

Ammonia, free	00.00	milligram per litre
" albuminoid	00.06	" " "
Solits, volatile	1.66	grains per gallon
" mineral	4.67	" "
" total	6.33	" "
Chlorine	0.80	" "

The chlorine is high enough to cause the sample to be looked upon with some suspicion, but otherwise it would be considered as a good sample of water.

The two samples of cheese were obtained on account of information that three persons had been made sick from the use of cheese purchased at the same place. The samples were purchased at the store of Jordan Stabler, Madison and Eutaw streets, on December 10, 1890. Sample No. 281, said to be from Otsego Co., N. Y., contained 6.53 grains of zinc to the ounce of cheese; and sample No. 282 purchased at same time and place, and called "Soft Cheese," contained 4.37 grains of zinc to the ounce of cheese.

The two samples of wine were received on December 15, 1890, and gave the following results:

Number.	Marked	Specific Gravity.	Total Solids, per cent.	Alcohol, by w't. Per cent.	Normal soda solution required to neut. 250 c.c. of the wine.	
284	" Mavrodaphne"	1.0437	12.24	13.98	22.70 c.c.	A light-colored wine
		0.990 to 1.010	1.5 to 3.0	10 to 12	15 c. c. to 26 c. c.	U. S. P., 1880
285	" Camerite"	0.9972	3.97	11.23	48.80 c.c.	A red wine
		0.989 to 1 010	1.6 to 3.5	10 to 12	15 c. c. to 26 c. c.	U. S. P., 1880

If the standard given by the U. S. P., 1880, is to be followed, neither of these samples would be considered as pure.

WM. P. TONRY, Ph. D.,
Analyst State Board of Health.

INSPECTOR GODMAN'S REPORTS.

Baltimore, June 30, 1890.

Dr. C. W. Chancellor,
Secretary State Board of Health:

Sir—According to instruction I give an account of operations up to date, and also inclose list of names of parties having meats unsound or not up to standard.

I have visited all the market houses in the city on the regular market days, and am glad to state that there is a very decided change for the better, since the dealers know that they are looked after. I have also visited all the western meat houses and provision stores of any prominence in the city. I have made it a daily practice to call on as many as I can, and take in and rectify all dereliction. I have had to make only one arrest, and that of a very aggravated case. I have also inspected all the meats going to public institutions, such as Bay View, the Jail and the Penitentiary, and I think the quality will be improved in the future.

I have condemned about twelve hundred pounds of unsound meats, and had them destroyed.

MEAT CONDEMNED AND DESTROYED.

August 4—310 pounds beef, Swift & Co.
" 5—175 " " Armour & Co.
" 8—175 " " Roher, Paca street.
" 9—145 " " Pepperkorn, Paca street.
" 11—960 " " Wimmer, Baltimore Abattoir Co.
" 11—450 " " George Mangel, Baltimore Abattoir Company.
" 11—145 pounds beef, Rose, Lexington Market.
" 16—150 " " Swift & Co., Pratt and Commerce.
" 22— 55 " poultry, I. Philips, Lexington Market.
" 30— 90 " veal, Jacob Staylor, Belair Market.
September 15—G. Peppler, Hanover Market, 45 pounds mutton, unsound.
" 15—Armour & Co., Camden street, 235 pounds beef, unsound.
" 15—C. Spook, North street, 120 pounds beef, unsound.
" 16—A. J. Fairbanks, Baltimore and Ohio Road, car load, cabbage, unsound.
" 27—Hammond, Point Market, 40 pounds poultry, unsound.
" 30—Pepperkorn, Paca street, 260 pounds beef, bruised.

Respectfully,

G. R. GODMAN,

Inspector.

BALTIMORE, October 1, 1891.

DR. C. W. CHANCELLOR,

Secretary of State Board of Health:

SIR—I herewith submit my report of work done for the period, beginning June 30th, 1890, and ending September, 1891.

The market houses, since my appointment, have materially improved, and are now in good order, both in cleanliness and healthy condition of meats.

The western meat houses, as well as the provision stores, are in better condition, and are using a better grade of meats.

1890.		POUNDS.
June.	Destroyed, beef, unsound	1400
July.	“ meats, “	1140
	“ poultry, “	114
	“ sausage, “	750
Aug.	“ meats, “	2700
	“ poultry, “	55
Sept.	“ meats, “	660
	“ poultry, “	40
	“ car load cabbage, unsound	
Oct.	“ meats, unsound	1465
Nov.	95 sheep, scab and itch	
Dec.	Destroyed 1 cow, cancer	
1891.		
Jan.	Destroyed meats, unsound	425
	“ 1 cow, cancer	
May.	13 cattle, lump jaw	
June.	1 cow, “	
	Destroyed beef, unsound	285
July.	“ poultry, “	95
	2 cattle, lump jaw	
Aug.	Destroyed beef, unsound	5340
Sept.	4 cows, lung fever	
		13,189

ADDITIONAL REPORT OF DISEASED CATTLE DESTROYED.

Oct.	Lump jawed and cancered	7
Nov.	" " "	11
Dec.	" " "	9
		27

Respectfully yours,

G. R. GODMAN,

Inspector.

REPORT OF INSPECTOR STRECKFUS.

BALTIMORE, October 1, 1891.

DR. C. W. CHANCELLOR,

Secretary State Board of Health:

SIR—I herewith transmit a tabulated statement of the articles condemned and destroyed by me during the fifteen months ending September 30, 1891.

Respectfully,

JOHN STRECKFUS, *Inspector.*

REPORT OF INSPECTOR STRECKFUS—*Continued.*

DATE.	FISH.			FRUIT.				VEGETABLES.				POULTRY.				
	Fish.	Crabs.	Oysters, Crab Meat and Frogs.	Bananas.	Canteloupe.	Melons.	Miscellaneous.	Cabbage.	Irish Potatoes.	Sweet Potatoes.	Miscellaneous.	Chickens.	Ducks.	Turkeys.	Rabbits.	
July, 1890...	6 lots, 1,000 lbs.	......	......	......	......	......	8 lots, 110 bush.	......	......	......	6 lots, 137 bu.	......	......	......	......	......
August, 1890	23 lots, 7,650 lbs.	10 lots, 46 brls.	1 brl. Crab Meat, 1 brl. Frogs	4 lots, 7,300	12 lots, 14,100	......	......	......	......	......	11 lots, 230 bu.	......	......	......	......	......
Sept., 1890...	16 lots, 2,425 lbs.	2 lots, 4 brls.	......	6 lots, 16,300	6 lots, 2,450	13 lots, 8,000	1 lot, 300 bush.	......	......	......	1 lot, 2 brls.	......	......	......	......	......
Oct., 1890....	5 lots, 1,900 lbs.	......	......	17 lots, 6,000	......	3 lots, 350	......	......	......	......	1 lot, 1 load,	......	......	......	......	......
Nov., 1890...	......	......	......	......	......	......	......	1 lot, 400	5 lots, 98 bu.	2 lots 13 bu.	1 lot,	1 lot, 350 lbs.	2 lots, 150 lbs.	......	3 lots 300	......
Dec., 1890...	......	......	......	......	......	......	......	......	6 lots, 560 bu.	2 lots 30 bu.	......	......	......	......	4 lots 728	......
Jan., 1891....	4 lots, 876 lbs.	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Feb. 1891....	3 lots, 600 lbs.	6 lots, 67 brls.	......	......	......	......	......	1 lot, 100	......	......	......	1 lot, 90 lbs.	......	1 lot, 10 lbs	......	......
March, 1891.	1 lot, 500 lbs.	......	3 lots, 18 gallons Shucked Oysters.	......	......	......	......	2 lots 475	......	......	......	......	......	......	......	....
April, 1891...	22 lots, 25,615 lbs.	......	......	......	......	......	......	......	......	......	......	......	......	......	......	
May, 1891....	11 lots, 4,700 lbs.	12 lots, 53 brls.	......	1 lot, 500	......	......	1 lot—400 Oranges.	......	......	......	......	......	......	......	......	......
June, 1891...	14 lots, 5,700 lbs.	7 lots, 42 brls.	......	......	......	......	......	......	......	......	......	......	......	......	......	......
July, 1891 ...	8 lots, 6,080 lbs.	4 lots, 16 brls.	......	1 lot, 1,500	......	......	1 lot—700 P'apples	......	......	......	......	......	......	......	......	......
August, 1891	7 lots, 5,000 lbs.	3 lots, 12 brls.	......	1 lot, 1,000	......	......	......	......	......	......	......	1 lot, 1 load.	......	......	......	1 lot—200 lbs. Corned Beef
Sept., 1891...	2 lots, 900 lbs.	1 lot, 3 brls.	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Resume for 15 months.	122 lots, 62,746 lbs.	45 lots, 243 brls	5 lots, 1 brl. Crab Meat, 1 brl. Frogs. 18 galls. Shucked Oysters.	30 lots, 32,600	18 lots, 16,550	16 lots, 8,350	11 lots.	4 lots 975	11 lots, 658 bu.	4 lots 43 bu.	21 lots.	3 lots, 440 lbs.	2 lots, 150 lbs.	1 lot, 10 lbs	7 lots 1,028	1 lot—200 lbs. Corned beef.

SUPPLEMENT TO PRECEDING REPORT — ARTICLES CONDEMNED AND DESTROYED.

Fish—27 lots, consisting of 92 barrels, 4 boxes, 22 bunches, and 11 lots, weighing 23,165 pounds (11 tons and 1,165 pounds).
Crabs—16 lots, consisting of 52 barrels.
Albany Beef—2 lots, consisting of 5 barrels, 1,250 pounds.
Fruit—Bananas—15 lots, ranging from a single bunch to a wagon load.
Pineapples—8 lots, ranging from 200 to a wagon load.
Oranges—4 lots, in boxes.
Apples—1 lot.

FINANCIAL STATEMENT.

Appropriations and expenditures of the Food and Drink Inspection Department for the two fiscal years of 1890 and 1891, ending September 30, 1891:

Appropriations for the two years	$3,600 00
Expenditures for the two years as per vouchers filed	3,594 58
Balance	$ 5 42

AN ACT

TO PROVIDE FOR THE PREVENTION OF THE ADULTERATION OF ARTICLES OF FOOD AND DRINK.

Section 1. *Be it enacted by the General Assembly of Maryland*, That the following sections shall be added to article forty-three of the Code of Public General Laws, to read as follows:

Section 48. That no person shall mix, color, stain or otherwise sophisticate any article of food or drink with any other ingredient or material for the purpose of gain or profit, nor shall sell or offer for sale, or order or permit any employee or other person, to sell, or offer for sale, any article so mixed, colored, stained or otherwise sophisticated, unless the same be so manufactured, used or sold, or offered for sale under its true and appropriate name, and unless a notice that the same is mixed or impure is marked, printed or stamped upon each package, roll, parcel or vessel containing the same, so as to be and remain at all times readily visible, or unless the person purchasing the same is fully informed by the seller of the true name and ingredients (if other than such as are known by common name thereof) of such article of food or drink at the time of making sale thereof or offering to sell the same.

Sec. 49. That no person shall mix any glucose, grape-sugar or other article of adulteration with any syrup, honey or sugar intended for human food, or any oleomargarine, swine beef fat, lard or any other foreign substance with any butter, cheese intended for human food, nor mix or mingle any glucose, grape-sugar, oleomargarine or other adulterant with any article of food or dietetics without distinctly marking, stamping or labelling the article or the package containing the same with the true and appropriate name of such adulterant, and the percentage in which it is used for the purpose of adulteration, or enters into the composition of the article so adulterated; nor shall any person sell, offer for sale, or permit to be sold or offered for sale, any article of food or drink or dietetics into the composition of which any adulterant has entered, without at the same time informing the buyer of the fact and the proportion in which such adulterant has been used; provided that nothing in this section shall be construed to prevent the use of glucose or grape-sugar in the manufacture of candy.

Sec. 50. That no person shall adulterate or sophisticate any wine, vinegar, spirituous or malt liquors, used or intended for drink or dietetic purposes, by mixing the same in the manufacture or preparation thereof, or otherwise with any deleterious drug, substance or liquid which is poisonous or injurious to health; and no person shall use or offer for sale or import into this State for sale any wine, vinegar, spirituous or malt liquor intended to be used for drink or dietetic purposes. knowing the same to be adulterated or in any way sophisticated.

SEC. 51. That if any person shall fraudulently adulterate for the purpose of sale, or shall sell or offer for sale any substance intended for the food of man, or any wine, vinegar, spirits, malt liquors or other liquor intended for drink or dietetic purposes, knowing the same to be adulterated or in any way sophisticated, he shall be punished by imprisonment in the county jail not longer than one year, or by fine not exceeding five hundred dollars, and the article so adulterated shall be forfeited and destroyed, or so disposed of as to prevent it from being exposed for sale or used for the food of man.

SEC. 52. That if any person shall sell or offer for sale any kind of diseased, corrupted or unwholesome provisions; such as poultry, game, flesh or preparations of flesh, fruits, vegetables, bread, flour, meal, milk or other things intended to be used for human food, he shall be punished by imprisonment in the county jail not more than one year, or be fined not exceeding five hundred dollars, or be both fined and imprisoned in the discretion of the court having jurisdiction, and the unwholesome provisions offered or exposed for sale shall be forfeited and destroyed, or so disposed of as to prevent their being used for food; provided, that nothing in this section shall apply to the shippers or consignors of green fruits or vegetables that may be spoiled in transitu.

SEC. 53. That the State Board of Health shall be charged with the duty of rendering effective the provisions of this Act, and shall take such steps and do such things as the said Board may deem necessary to detect and publicly expose any adulteration or corruption of all articles, solid or liquid, intended or offered for sale as food or drink, and shall, when deemed necessary, have the suspected article subject to chemical or other scientific examination in order to establish more clearly the fact and degree of adulteration.

Sec. 54. That whenever the said Board of Health or its proper officer shall be satisfied that any article of food, condiment or drink has been adulterated or is otherwise unsound or unwholesome, the said Board or its proper officer shall forbid the sale or disposal of such article for human food, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man, and the person or persons to whom the same belongs, or did belong at the time of exposure for sale, or in whose possession, or on whose premises the same was found, refusing or neglecting to destroy or otherwise dispose of such unsound or unwholesome article as directed, shall be liable to the penalty imposed under the provisions of the fifty-second section of this Act.

Sec. 55. That the said Board of Health or its proper officer, or any inspector or inspectors appointed by the said Board, are empowered at all reasonable times to inspect and examine any live animal, carcass, meat, poultry, game, flesh, fish, fruits, vegetables, bread, milk, wine, spirits, malt or other liquors or things exposed for sale or deposited in any place for the purpose of sale or of preparation for sale, and intended for the food of man, the proof that the same was not exposed or deposited for any such purpose or was not intended for the food of man resting with the party charged, and if such animal, carcass, meat, poultry, game, flesh, fish, fruits, vegetables, bread, milk or other things appear to the said Board, or its proper officer or inspector, to be diseased or unsound or unwholesome and unfit for the food of man, the said Board, or its proper officer, shall issue an order preventing the sale of such article or articles for human food, and any person neglecting or refusing to obey such an order shall be deemed guiltyof a misdemeanor, and shall be punished by fine in any sum not less than fifty dollars, and in default of the payment thereof by imprisonment in the public jail not more than six months.

Sec. 56. That it is hereby made the duty of the prosecuting attorneys of this State to appear for the people and to attend to the prosecuting of all complaints under this Act, in all the courts of their respective counties or the City of Baltimore, as the case may be.

Sec. 57. That the sum of twenty-five hundred dollars, or so much thereof as may be necessary, be annually appropriated for defraying the expenses of chemical and scientific examination of suspected articles of food and drink; for salary of inspectors and other necessary expenses, to be paid by the Treasurer of the State on the warrant of the Comptroller, at such times and in such sums as the said Board may direct.

Sec. 2. *And be it enacted*, That this Act shall take effect from the date of its passage.

Approved April 8, 1890.

ELIHU E. JACKSON,

Governor.

PART VII.

MORTALITY AND VITAL STATISTICS.

In presenting a record of the mortality and births in the State, it is a matter of regret that the statistics are necessarily so incomplete and unsatisfactory, only such as could be gathered from the United States census reports, and from the tables compiled by Mr. A. R. Carter, the Statistician of the City Health Department, which are herewith presented.

The value of a full and correct record of vital statistics is recognized in all the older countries, and is coming to be demanded in this country. In Massachusetts, New Jersey, New Hampshire, and Connecticut the registration records of births and deaths are probably very nearly accurate, and in themselves are valuable as a life history of the State. In other states, as Michigan, Iowa, Minnesota, California, &c., the statistics are not worthy of great reliance, but the facts gathered may be used to establish data for reasoning, or standards of comparison. "Registration reports," says Buck, "yield statistical results which throw light upon the casual conditions under which prevailing diseases occur, and thereby become the source of invaluable contributions to the science of preventive medicine."

In Maryland, outside the city of Baltimore, there is no system of registration that can be relied upon to ascertain the movement of population, to facilitate the identification of individuals for the transmission of property, to protect life against crime, to establish the relative healthfulness of different localities, to afford data for the determination of life contingencies upon which to form the basis of life insurance; or, lastly, to furnish information of value concerning the state of the public health. The sanitary authorities are at all times groping in the dark as to the prevalence of preventable diseases, and are thus unable to take the necessary measures for the protection of the public health with the least possible delay. The only method of securing a complete registration of deaths is that based upon burial permits, and it is to be hoped that this most important matter will soon be placed on a proper footing by the Legislature, in order that the absence of an efficient system for the registration of vital statistics may no longer remain a reproach to the State. Few men appreciate the value of such statistical information. Many regard the time and money expended in the preparation of registration tables as a foolish waste of effort; but the enlightened statesman might be pardoned, if in looking at one particular evidence of advancement, he should select as a touchstone of civilization a good and efficient system of registration of vital statistics. Such information is the first step in the elaboration of the science of society, and since governments rest upon the knowledge of mankind, it is an indispensable aid to the political economist, and statesman as well as the sanitarian.

The annual death rate in the city of Baltimore, estimated on a population of United States census, June 30, 1890, is 23.45 per thousand of inhabitants, which is lower than a majority of the Foreign towns named in the subjoined list:

DEATH RATES IN FORTY-FIVE FOREIGN AND AMERICAN TOWNS.

	Annual Deaths per 1,000 of the Population.		Annual Deaths per 1,000 of the Population.
Vera Cruz	70.5	Leipsic	26.1
Valparaiso	64.6	Turin	25.6
St. Petersburg	51.4	Dresden	25 4
Havana	45.7	Stockholm	24.7
Madras (1887)	40.3	Lyons	24.7
Rio Janeiro	39.4	Hamburg	24.5
Madrid	37.4	Bucharest	24 5
Montreal	37.2	Brussels	23.9
Buda-Pesth	35.2	Boston	23.5
Breslau	32.5	Baltimore (1890)	23.45
Rouen	31.3	Paris (1887)	23.4
Calcutta	31.1	Rotterdam	23.3
Mexico	30.9	Berlin (1889)	23.1
Milan	30.6	Quebec	22.9
Buenos Ayres	30.1	Venice	22.7
Vienna	29.0	Copenhagen	22.1
Palermo	28.5	Amsterdam (1887)	22.1
Marseilles	28.0	Geneva	21 2
Chicago	27.2	Philadelphia	20.3
Rome	26.8	St. Louis	19.3
Bordeaux	26.7	Christiania	18.8
Bombay (1887)	26.3	San Francisco	18.1
New York	26.2		

In countries in which the climate is healthy, hygiene properly attended to, and the population in a normal condition as regards age, the ordinary mortality incident to human nature would probably cause the death rate to be in the proportion of about 16 or 17 per 1,000 persons living. It should however, be borne in mind that the death rates based merely upon the total population, in common with birth and marriage rates, calculated upon a like basis, are not always fair tests of the state of a community. If the proportion of very young or old people is high, the death rate will also be high; but if on the other hand, the number of persons at the middle ages is excessive, the death rate will be low.

Mr. Mulhall (*Dictionary of Statistics*, page 127) gives the ordinary death rate at various ages for different countries as follows:

DEATH RATE AT VARIOUS AGES IN DIFFERENT COUNTRIES.

Countries.	Number of Deaths per 1,000 living at each Age.						
	Under 5.	5 to 10.	10 to 25.	25 to 45.	45 to 55.	55 to 65.	65 to 75.
United States.	58.8	10.1	5.4	10.8	17.6	27.2	51.4
England	63.6	6.6	5.5	10.2	17.4	31.8	64.3
France	75.6	9.2	8.8	12.7	16.6	28.3	66.3
Prussia	....	9.2	6.4	11.5	18.6	33.0	64.5
Austria	111.7	9.8	6.6	11.3	21.1	41.5	92.8
Switzerland	....	8.5	6.3	11.6	19 3	38.4	82.5
Italy	110.6	11.6	7.8	11.7	17.3	33.1	70 1
Spain	106.2	11.7	8.8	12.9	23.8	42.0	95.0
Belgium	68.1	12.7	8.1	12.9	19 0	32.3	74.5
Sweden	57.6	8.0	4.8	8.2	14.7	27.4	62.6

In the following list the countries are placed in order according to their respective rates of infantile mortality, the country with the highest rate being placed first, and the rest in succession:

INFANTILE MORTALITY IN VARIOUS COUNTRIES.

	Deaths under 1 Year of Age to 100 Births.
Wurtemburg	31.25
Bavaria	30.84
Saxony	28.22
Baden	26 17
Austria	25.63
Alsace-Lorraine	21.27
Italy	20.97
Prussia	20.78
Holland	19.32
Switzerland	18.79
France	16.60
England	14.92
Belgium	14.82
South Australia	14.23
Denmark	13.75
Sweden	13.19
Queensland	13.00
Victoria	12.40
Scotland	12.20
New South Wales	11.39
Norway	10.49
Tasmania	10.46
New Zealand	9.70
Ireland	9.50
Mean of the countries named	17.50

It will be seen from the above that Ireland stands below all the other countries in infantile mortality.

The record of the Baltimore City Health Department shows that during the year 1890 there were 10,198 deaths, and of these there died:

Under 1 year	2,740	Between 60 and 70 years	1,085
Between 1 and 2 years	894	“ 70 “ 80 “	498
“ 2 “ 5 “	483	“ 80 “ 90 “	264
“ 5 “ 10 “	441	“ 90 “ 100 “	41
“ 10 “ 15 “	172	“ 100 “ 110 “	6
“ 15 “ 20 “	307	Above 110 years	2
“ 20 “ 30 “	843		
“ 30 “ 40 “	834	Total	10,198
“ 40 “ 50 “	784	Total under 5 years	4,117
“ 50 “ 60 “	804		

Some striking facts are presented in regard to the mortality among children. Of the 8226 children born there were 800 born dead, or about one still-birth in 10.

The number of children who died before the completion of their first year was 2,740 or a fraction more than 33 out of every hundred born, or one in every three born. Including those who were born dead and who died before the completion of their first year the number of deaths was 3,540, or more than one out of every three children born.

The number of children born dead and the number dying in their first year is simply appalling, and might assuredly be diminished by the influence of competent circumstances, and of moral habits; in as much as the former would admit of more indulgence and attention to the wants of mothers and children among the great mass of the people; while the latter would occasion the prevalence of more maternal care.

It is the opinion of many physicians in Baltimore that the great mortality among children under 5 years old, (4117 during the year 1890) is occasioned in a great measure by the noxious exhalation from the many thousand cesspools which constantly poison the atmosphere of the city during the summer months, when the mortality sometimes reaches above 600 per month, while the number of children who do not survive the first year of their life will always remain very considerable, there can be no doubt that the aggregate mortality would be greatly lessened by proper attention to drainage, sewerage, ventilation and food.

Birth rates based upon a comparison of the number of events with the total population, are apt to mislead, unless the population is in a normal condition. It must be quite evident that, if there is not a sufficient proportion of married women at the fruitful or child-bearing ages in a community, the birth rate is not likely to be high, but that an excess of such women would probably cause a high birth rate.

The births (white and colored) registered in Baltimore during the year 1890 numbered 9398 as against 8826 in 1880. The increase in the year under review, as compared with the census year of 1880 was only 572, notwithstanding the large increase of population by superadded territory &c. It is probable that these figures which show a lower birth rate than death rate, do not represent the true condition of things, otherwise the disparagement would be calculated to cause inquiry and anxiety. In the highest sanitary conditions it is observable that there is always a considerably larger proportion of births than deaths, nor is this relation apt to be changed by pestilence. The late Mr. Chadwick, the Nestor of Sanitation in England, has demonstrated that pestilence is attended with a rapid augmentation of births, and does not reduce the numbers of populations, but only weakens them, and augments the proportions of dependent pauperism.

Comparing the birth rates in the following foreign towns (including two in British India) with that of Baltimore city, it will be found that the birth rate in the latter city is considerably lower than that in any of the towns named:

BIRTH RATES IN FOREIGN TOWNS, 1880.

	Births per 1,000 of Population.		Births per 1,000 of Population.
Alexandria	42.9	Dresden	34.5
Madras (1887)	41.2	Christiania	33.7
Buda-Pesth	40.6	Berlin (1889)	32.8
Hamburg (State)	39.5	Brussels	31.2
The Hague	39.3	New York	30.4
Rotterdam	38.3	Turin	29.8
Vienna	38.3	Boston (1883)	28.3
Munich	38.2	Paris (1887)	27.2
Rome	37.3	Venice	23.9
Copenhagen	36.8	Geneva	22.9
Breslau	36.7	Bombay	20.0
Amsterdam	36.6	Baltimore (1889)	18.7

The following are the birth rates in 47 British towns:

BIRTH RATES IN BRITISH TOWNS, 1887.

	Births per 1,000 of the Population.		Births per 1,000 of the Population.
Cardiff	41.1	Salford	31.9
Newcastle	39.1	Birmingham	31.8
Preston	38.5	London	31.7
Glasgow	37.0	Plymouth	31.5
Portsmouth	36.8	Oldham	31.3
Manchester	35.9	Liverpool	31.2
Blackburn	35.8	Derby	30.0
Sunderland	34.6	Bristol	29.7
Norwich	33.9	Edinburgh	29.3
Nottingham	33.3	Halifax	28.4
Wolverhampton	33.2	Dublin	28.0
Sheffield	32.9	Bradford	27.7
Leicester	32.8	Huddersfield	27.7
Bolton	32.5	Brighton	25.8
Birkenhead	32.5	Baltimore (1890)	21.63
28 British Towns	32.2		

The following figures represent the proportions of twins and triplets to the total births in the countries named, over a series of years:

TWINS AND TRIPLETS IN VARIOUS COUNTRIES.

COUNTRIES.	Per 1,000 Births.		COUNTRIES.	Per 1,000 Births.	
	Cases of Twins.	Cases of Triplets.		Cases of Twins.	Cases of Triplets.
Ireland	17.6	....	Norway	11.8	.15
Iceland	14.2	.33	Scotland	11.7	....
Denmark	13.7	.24	England	11.2	...
Sweden	13.6	.18	France	10.1	.12
Austria	13.4	.18	Belgium	9.1	.10
Germany	12.9	.13	Queensland	9.1	.012
Holland	12.8	....	New Zealand	8.96	.077
Russia	12.1	....	New South Wales	8.75	.058
Switzerland	12.0	....	Spain	8.4	....
Italy	11.8	.14	Victoria	7.85	.053

The illegitimate children born in Baltimore in 1890 numbered 409, or one to about every twenty-five births registered, as against a proportion of one to every twenty-six in preceding years.

The following figures show certain countries arranged in order according to the extent of illegitimacy prevailing in each, the proportion of illegitimate births being also shown:

ILLEGITIMACY IN VARIOUS COUNTRIES.

Country.	Illegitimate Births to every 100 Children Born.		Illegimate Births to every 100 Children Born.
Austria	12.9	England	4.9
Denmark	11.2	Switzerland	4.6
Sweden	10.2	New South Wales	4.3
Scotland	8.5	Victoria	4.2
Norway	8.5	Tasmania	4.2
Germany	8.4	Queensland	3.7
France	8.1	Holland	3.5
Belgium	7.0	Russia	3.1
Italy	6.8	Ireland	2.5
Portugal	5.6	New Zealand	2.4
Spain	5.5	Greece	1.6

According to the above figures, more illegitimacy prevails in Austria, and less in Greece than in any other countries.

By the following figures it would appear that illegitimacy is less rife in Baltimore than in many of the foreign cities named below:

ILLEGITIMACY IN LARGE CITIES.

	Illegitimate Births to every 1,000 Children Born.		Illegitimate Births to every 1,000 Children Born.
Vienna	449	Leipsic	211
Prague	439	Dresden	208
Munich	439	Milan	204
Stockholm	396	Rome	194
Moscow	300	Venice	189
Buda-Pesth	299	Breslau	186
Copenhagen	279	Bucharest	175
Paris	268	Liege	174
St. Petersburg	236	Christiania	162
Trieste	211	Stuttgart	160
Berlin	154	Palermo	101
Ghent	144	The Hague	90
Hamburg	138	Naples	89
Frankfort	132	Rotterdam	76
Turin	132	Buenos Ayres	74
Antwerp	129	Melbourne	69
Cologne	124		

The proportion which the number of marriages bear to the total population is generally called the marriage rate. In Baltimore this amounts to about 10.00 per 1000 of the mean population.

It has been shown that the frequency of marriage is not dependent upon the numbers of the total population, still less upon the number of marriageable women, but almost entirely upon the number of marriageable men the community contains, the tendency of whom to marry is modified by their habits and occupations, and upon the view they take of their future prospects. Thus men have a greater tendency to marry in prosperous than in dull times, and the men of a rural, and especially of an agricultural community, have a greater tendency to marry than those of an urban one. In civilized countries, the age at which four-fifths of the males who marry enter the marriage state is between 20 and 35 years. It naturally follows, therefore, that on the number of single males at such ages the number of marriages mainly depends.

The following table gives for each of the five years ended with 1888 a statement of the marriage rates in such foreign countries as the information is available for:

MARRIAGE RATES IN EUROPEAN COUNTRIES, 1884 TO 1888.

Countries.	Number of Marriages per 1,000 of Mean Populations.					
	1884.	1885.	1886.	1887.	1888.	Mean of 5 Years.
Hungary	10.1	9.9	9.6	8.9	..	9.6
Prussia	8.0	8.1	8.1	8.0	8.0	8.0
Italy	8.2	7 9	7.8	7.7	7.8	7.9
German Empire...	7.8	7.9	7 9	7.8	7.8	7.8
Austria	7.8	7.6	7.7	7.8	7.9	7.8
France	7.6	7.4	7.4	7.3	7.2	7.4
Denmark	7.8	7.6	7.1	7.0	7.1	7.3
England and Wales	7.5	7.2	7.0	7.1	7.1	7.2
Belgium	6.7	6.8	6.7	7.1	7.3	6.9
Holland	7.2	6.1	6.9	7.0	6.9	6.8
Switzerland..	6.8	6.9	6.8	6.8	7.0	6.8
Spain	6 7	..	..	..	..	6.5
Scotland..........	6.7	6.4	6.2	6.3	6.2	6.4
Norway,..........	6.8	6.6	6.5	6 2	6.1	6 4
Sweden	6.5	6.6	6.4	6.2	..	6.4
Ireland	4.5	4.3	4.2	4.4	4.2	4.3

The following statement gives the proportion of marriages of persons of different conjugal conditions in various countries:

FORMER CONDITION OF PERSONS MARRYING IN DIFFERENT COUNTRIES.

Countries.	Per 1,000 Marriages Celebrated, Number between			
	Bachelors and Spinsters.	Bachelors and Widows.	Widowers and Spinsters.	Widowers and Widows.
Victoria	847	50	66	37
Austria	758	62	129	51
Belgium	834	50	81	35
Denmark	832	50	96	22
England and Wales	819	44	84	53
Finland	788	54	113	45
France	844	41	78	37
Greece	861	39	67	33
Holland	805	44	103	48
Hungary	752	50	97	101
Ireland	857	31	86	26
Italy	832	37	94	37
Massachusetts	790	48	103	59
Norway	854	34	91	21
Prussia	807	53	105	35
Roumania	848	28	61	63
Russia in Europe	772	42	98	88
Scotland	851	29	89	31
Spain	811	40	100	49
Sweden	854	34	91	21
Switzerland	816	49	104	31
Vermont	747	44	128	81

By the following table it would appear that the largest proportion of widowers remarry in Vermont and a smaller in Greece, and a larger proportion of widows remarry in Hungary and a smaller in Sweden and Norway than in any other of the countries named:

RE-MARRIAGES IN VARIOUS COUNTRIES.

COUNTRIES.	Widowers remarried per 1,000 marriages.	COUNTRIES.	Widows remarried per 1,000 marriages.
Vermont	209	Hungary	151
Hungary	198	Russia in Europe	130
Russia in Europe	186	Vermont	125
Austria	180	Austria	113
Massachusetts	162	Massachusetts	107
Finland	158	Finland	99
Holland	151	England and Wales	97
Spain	149	Holland	92
Prussia	140	Roumania	91
England and Wales	137	Spain	89
Switzerland	13	Prussia	88
Italy	131	Victoria	87
Roumania	124	Belgium	85
Scotland	120	Switzerland	80
Denmark	118	France	78
Belgium	116	Italy	74
France	115	Denmark	72
Ireland	112	Greece	72
Sweden	112	Scotland	60
Norway	112	Ireland	57
Victoria	103	Sweden	55
Greece	100	Norway	55

From the above it appears that more widowers remarry than widows. Formerly it was different, and the preponderance of re-marriages of widows over those of widowers was greater. Such a preponderance would be likely to happen only in a country in which females are much less numerous than males; and the fact of the reverse having been the case of late years would afford indirect proof, if such were needed, that the proportion of marriageable females to marriageable males in the population has increased.

An interesting table is given in the Victorian Year Book for 1889–90, from which most of the foregoing data have been taken, showing the ages of the husbands and of the wives in combination:

AGES OF BRIDEGROOMS AND BRIDES IN COMBINATIONS, 1889

Ages of Brid'grooms	Ages of Brides.																			
	Under 15.	15 to 16.	16 to 17.	17 to 18.	18 to 19.	19 to 20.	20 to 21.	21 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	Unspecified.	Total Bridegrooms.
18 to 19 years	..	..	..	....	2	....	....	4	....	....	....	....	..	..	..	..	..	..	..	..	6
19 to 20 "	..	2	2	8	11	7	5	23	4	.. .	....	....	..	..	..	..	..	..	..	..	62
20 to 21 "	..	3	2	6	19	24	20	41	8	1	....	....	..	..	..	..	..	..	..	..	124
21 to 25 "	1	3	25	91	185	227	296	1564	332	37	8	. ..	..	..	..	..	..	..	..	3	2772
25 to 30 "	..	..	10	49	118	183	253	1576	1111	181	25	9	3	1	1	..	..	..	..	3	3523
30 to 35 "	..	..	5	9	35	50	71	467	522	234	47	12	5	..	..	..	..	.	..	..	1457
35 to 40 "	..	..	1	3	1	8	12	109	164	94	55	13	11	3	1	..	..	.	..	..	475
40 to 45 "	..	..	..	....	4	2	2	45	56	64	38	23	13	4	..	..	1	..	..	..	252
45 to 50 "	..	..	..	1	1	1	....	18	37	39	34	19	19	7	..	..	..	1	..	..	177
50 to 55 "	..	..	..	....	1	....	2	7	11	22	18	26	16	10	3	1	1	..	..	.	118
55 to 60 "	..	..	..	....	....	...	....	3	8	9	12	17	16	8	7	3	3	..	..	..	86
60 to 65 "	..	..	..	....	....	....	....	3	....	5	6	8	10	15	3	3	..	..	..	..	53
65 to 70 "	..	..	..	.. .	....	...	....	1	....		3	2	2	3	5	5	4	..	..	..	25
70 to 75 "	..	..	..	....	....	....	....	1	....	1	1	2	..	1	3	2	1	..	..	..	12
75 to 80 "	..	..	..	....	....	...	....	....	....	....	....	1	3	1	..	..	..	..	1	..	6
80 to 85 "	..	..	..	...	....	....	....	....	....	....	....	....	..	..	..	1	1	..	..	..	2
Unspecified	..	..	..	...	....	1	1	1	....	....	....	....	..	..	..	..	..	.	..	41	44
Total Brides	1	8	45	167	378	503	662	3862	2253	687	247	132	98	53	23	15	11	1	1	47	9194

NOTE.—This table may be read thus: Three men between 21 and 25 married girls between 15 and 16; eight women between 35 and 40 married men between 21 and 25, etc.

An examination of the 9,144 cases in which the ages of both parties are specified will show that in 3,060 instances, or 33 per cent. of the whole, both parties to the marriage were about the same age; in 812 instances, or 9 per cent. of the whole, the wife was older than the husband; and in 5,272 instances, or 58 per cent. of the whole, the husband was older than the wife.

Some striking inequalities of age amongst the parties married appear in several of the columns, as, for instance, a man between sixty-five and seventy and a man between seventy and seventy-five married women between twenty-one and twenty-five; three men between fifty and fifty-five married girls under twenty-one; and three men between forty-five and fifty married girls between seventeen and twenty. On the other hand, four women between twenty-one and twenty-five married youths of eighteen; a woman between thirty and thirty-five married a youth of twenty; a woman between fifty-five and sixty married a man between twenty-five and thirty; a woman between sixty-five and seventy married a man between forty and forty-five, etc.

It will be noticed that six youths, aged eighteen, took upon themselves the cares and responsibilities of matrimony, four of their wives, however, being at least three years older than their husbands. On the other hand it will be remarked that eight men, who had passed the age of seventy-five—two of whom had passed the age of eighty—entered the marriage state, the bride of one being of the same mature age as her husband, whilst the brides of the others were generally much younger; the youngest, however, not being less than forty.

TABLE I.

Annual Number of Births and Deaths as furnished by the Last Census Report, in the State of Maryland and the City of Baltimore.

Births and Deaths.		Total Number of Births.	Total Number Deaths.	Ratio per 1,000 Deaths.	Scarlet Fever.	Typhoid Fever.	Malarial Fever.	Diphtheria.	Croup.	Diarrhœa and Dysentery.	Consumption.	Pneumonia.	Childbirth.	Old Age.	Still Born.
In the State	Male............	15,059	8618	18.6	292	246	124	285	207	907	1059	606	......	131	471
	Female..........	14,516	8301	17.6	291	229	136	335	157	824	1315	505	100	226	335
In the City	Male............	5,339	4292	27.3	219	83	43	153	96	425	555	242	......	52	364
	Female..........	5,109	4056	23.2	210	88	46	165	84	391	607	183	23	102	274

TABLE II.

Summary of Sanitary Statistics of the City of Baltimore. Population by Wards, Police Census, November, 1890.

Wards.	White.	Colored.	Total.
First	23,001	443	23,474
Second	19,024	391	19,415
Third	14,151	2,167	16,318
Fourth	13,987	2,413	16,400
Fifth	12,406	3,264	15,670
Sixth	24,302	3,843	28,145
Seventh	24,449	1,290	25,739
Eighth	22,368	4.314	26 682
Ninth	13,640	3,242	16,822
Tenth	11,855	4,292	16,147
Eleventh	10,264	11.205	21,269
Twelfth	20,175	5,251	25,426
Thirteenth	12,619	2,407	15,026
Fourteenth	15,739	2,323	18,062
Fifteenth	11,567	3,574	15,141
Sixteenth	10,557	4 281	14,838
Seventeenth	25,719	764	26,483
Eighteenth	24,094	3,393	27,487
Nineteenth	20,032	5,426	25,458
Twentieth	16,811	3,799	20,610
Twenty-first	15,510	918	16,428
Twenty-second	22,094	2,233	24,327
Total	384,394	71,033	455,427

Total deaths	White	Male	4,112
		Female	3,914
	Colored	Male	1,047
		Female	1,125
Total births reported	White	Male	4,198
		Female	4,028
	Colored	Male	571
		Female	601

Average daily water supply, 45,000,000 gallons.

TABLE III.

Vital Statistics of the City of Baltimore, for the Year 1890.*

Population by United States Census, June 30, 1890. Total				434,439
“ “ Police Census—November 29, 1890, whites			384,394	
“ “ “ “ “ “ “ colored			71,033	
				455,427
(Police Census being adopted by Board of Health.)				
Marriages, 4,366. Marriage rate per 1,000 of population				9.60
Births (reported), white males	4,198			
“ “ “ females	4,028			
		8,226		
“ “ colored males	571			
“ “ “ females	601			
		1,172		
				9,398
Birth rate per 1,000 white population			21.58	
“ “ “ “ “ colored population			16.50	
				20.65
Still births, 800. Rate per 1,000 population				1.76
Total mortality—native white males			3,249	
“ “ “ “ females			3,105	
“ “ foreign “ males			863	
“ “ “ “ females			809	
“ “ colored males			1,047	
“ “ “ females			1,125	
Total whites			8,026	
Total colored			2,172	
Total mortality				10,198
Annual death rate per 1,000 of population—white				20.98
“ “ “ “ “ “ “ colored				30.15
“ “ “ “ “ whole population				22.41

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* Tables compiled by Mr. A. R. Carter of the City Health Department.

VITAL STATISTICS—Continued.

Total	number	of deaths	from	Measles	248
“	“	“	“	Scarlet Fever	42
“	“	“	“	Diphtheria	274
“	“	“	“	Croup	45
“	“	“	“	Whooping Cough	100
“	“	“	“	Typhoid Fever	247
“	“	“	“	Typho–Malarial Fever	54
“	“	“	“	Cerebro-Spinal Fever	31
“	“	“	“	Consumption	1,249
“	“	“	“	Pneumonia	981
“	“	“	“	Bronchitis	230
“	“	“	“	Bright’s Disease	187
“	“	“	“	Cancer	276
“	“	“	“	Disease of Heart	430
“	“	“	“	Cholera Infantum	507
“	“	“	“	Cholera Morbus	23
“	“	“	“	Pernicious Anaemia	4
“	“	“	“	Illuminating Gas	5

TOTAL DEATHS FROM ABNORMAL CONDITIONS CONNECTED WITH PARTURITION.

Puerperal Fever	7
“ Convulsions	19
“ Metritis	2
“ Peritonitis	12
“ Septicæmia	24
Placenta Prævia	5
Child Birth	15
Metro-Peritontis	0
Abortion	5
Embolism	4
Hemorrhage of Uterus	8
Post Partum Hemorrhage	3
Dystocia	1
Extra Uterine Pregnancy	3
Cæsarean Section	1

VITAL STATISTICS—Concluded.

Total mortality of children under five years of age	4,117
Percentage of deaths of children under five years of age to total mortality	40.37
Total mortality from zymotic diseases	2,181
Percentage of deaths from zymotic diseases to total mortality	21.39
Total mortality from diarrhœal diseases of children under five years of age	859
Total mortality from diarrhœal diseases of all ages	1,092

DEATHS IN PUBLIC INSTITUTIONS.

Baltimore City Jail, 5; Maryland Penitentiary, 11; Hospitals and Asylums, 703. Total	719
Deaths reported by City Coroners, including inquests	491
Total number of autopsies by Medical Examiners	66

TABLE IV.

Deaths from Zymotic Diseases, Consumption and Pneumonia, in each Ward, for Year Ending December 31, 1890.

ZYMOTIC DISEASES.	WARDS.																						Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Croup	5	2	2	5	2	3	2	...	1	1	1	1	1	1	2	...	5	3	1	4	...	3	45
Cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	....
Cholera Infantum	43	57	20	10	16	30	21	21	11	13	26	17	10	17	18	21	25	40	25	25	21	20	507
Cholera Morbus	1	1	1	1	1	1	...	1	2	1	1	1	1	...	2	2	3	...	2	...	1	...	23
Diphtheria	15	9	5	6	3	12	20	14	6	12	15	24	7	14	5	5	11	15	24	33	10	9	274
Diarrhœa	15	7	8	5	4	8	11	9	5	3	3	8	6	4	8	5	5	10	8	...	4	6	149
Dysentery	24	9	9	4	6	23	10	12	10	2	8	12	6	2	1	4	17	14	18	9	4	8	212
Entero Colitis	20	8	4	3	2	11	15	2	2	4	1	2	3	9	1	...	2	6	5	3	9	7	119
Erysipelas	4	1	...	1	1	1	...	5	1	2	1	2	...	1	1	2	2	...	...	...	...	1	25
Fever, Cerebro Spinal	1	1	...	...	1	2	1	1	...	3	1	5	...	1	1	5	...	2	1	1	...	7	31
" Intermittent	1	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	4
" Malarial	6	6	2	4	3	1	5	4	2	1	...	2	...	1	...	3	2	2	1	1	...	1	47
" Puerperal	...	...	2	...	2	...	...	...	...	...	...	...	...	1	1	...	...	2	...	...	...	...	7
" Remittent	2	...	...	1	...	1	1	2	...	...	...	2	...	...	1	1	2	1	...	1	...	...	15
" Scarlet	3	1	3	2	1	...	5	2	...	2	3	3	1	...	1	...	1	2	2	3	1	3	42
" Typhoid	9	11	8	9	6	21	10	20	12	7	12	13	12	3	2	8	6	13	15	15	13	20	247
" Typhus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......

Fever, Typho-Malarial..	3	6	2	1	1	4	4	1	5	...	3	1	4	2	3	1	1	7	1	2	1	1	54
Mumps........................	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2
Measles	26	34	9	8	7	19	8	10	5	2	5	12	5	4	10	6	34	24	8	3	3	6	248
Pyæmia	1	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	1	1	1	...	...	7
Small Pox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......
Septicæmia	...	...	1	...	...	1	1	2	1	...	...	1	3	...	...	1	...	1	1	...	1	1	15
Tonsilitis	1	1	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	2	1	1	...	...	8
Varicella........................	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	......
Whooping Cough	8	5	4	2	4	8	3	7	3	4	3	8	2	2	6	5	4	7	4	3	3	5	100
Total Zymotic Diseases.	189	160	80	63	62	147	117	113	67	58	83	114	62	66	63	65	120	152	119	112	72	98	2181
Consumption	73	37	58	38	50	90	74	71	64	32	51	64	45	36	56	39	59	63	68	69	40	71	1249
Pneumonia............	71	46	25	43	45	82	46	35	47	32	28	43	38	54	34	27	72	74	34	53	23	29	981

TABLE V.

Showing the Mortality from Certain Diseases, also the Total Mortality from all causes for a Period of Nine Years, 1881–1889 *inclusive, as Compared with the Year* 1890.

YEARS.	Consumption.	Pneumonia.	Bronchitis.	Diphtheria and Croup.	Scarlet Fever.	Typhoid Fever.	Whooping Cough.	Measles.	Small Pox.	Total Mortality, all Causes.
1881	1,206	466	106	881	215	197	93	75	11	8,816
1882.	1,217	516	110	929	179	165	43	71	551	8,923
1883.	1,272	572	129	792	334	126	59	130	633	9,380
1884.	1,126	560	107	470	104	151	120	228	1	8,293
1885.	1,270	581	88	400	68	155	63	16	0	8,153
1886.	1,182	631	129	318	32	150	91	201	1	8,339
1887.	1,097	535	113	302	36	156	98	85	0	8,372
1888.	1,151	740	126	216	44	161	112	176	0	8,936
1889.	1,147	592	133	208	71	191	54	11	0	8,703
Total	10,668	5,193	1,041	4,516	1,083	1,442	733	993	1,197	77,915
Yearly average.	1,185	577	115	502	120	161	81	110	133	8,657
1890.	1,249	981	230	319	42	247	100	248	0	10,198
Total for 10 years.	11,917	6,174	1,271	4,835	1,125	1,699	833	1,241	1,197	88,113

TABLE VI.

Showing the Mortality from Certain Diseases, also the Total Mortality from all causes during the first four months of each year, for a period of nine years, 1881–1889 *inclusive, as compared with the same period of the year* 1890.

Year.	Consumption.	Pneumonia.	Bronchitis.	Diphtheria and Croup.	Scarlet Fever.	Typhoid Fever.	Whooping Cough.	Measles.	Small Pox.	Total Mortality, all causes.
1881	514	292	62	220	147	40	28	40	....	3,286
1882	524	325	54	321	98	51	17	24	47	3,204
1883	574	330	66	357	169	31	12	20	628	4,158
1884	511	352	54	175	59	49	48	214	....	3,475
1885	622	426	64	137	43	65	15	2	....	3,441
1886	552	409	68	128	21	33	33	127	....	3,412
1887	509	309	52	98	16	52	26	22	....	3,134
1888	513	460	69	94	19	32	54	15	....	3,469
1889	512	331	70	85	30	52	24	3	....	3,205
Total	4,831	3,234	559	1,615	602	405	257	467	675	30,784
Average	537	359	62	179	67	45	29	52	75	3,420
1890	602	648	105	130	19	69	27	221	....	4,485

TABLE VII.

Showing the Mortality from Consumption, as compared with the Total Mortality from all causes—White and Colored, Males and Females—for the year 1890. *Also for a Period of Sixteen Years,* 1875–1890 *inclusive.*

1890. Week ending Saturday.	White Males.	White Females.	Colored Males.	Colored Females.	Weekly Mortality Consumption.	Mortality. all causes.	
						White	Colored.
Jan. 4......	6	14	1	3	24	141	25
" 11......	15	8	4	3	30	167	44
" 18......	21	12	5	2	40	219	67
" 25	21	15	3	2	41	225	42
Totals.....	63	49	13	10	135	752	178
Feb. 1......	11	16	5	4	36	167	45
" 8......	9	14	4	5	32	151	38
" 15......	10	10	2	2	24	139	42
" 22......	9	6	5	2	22	154	51
Totals.....	46	46	16	13	114	611	176
Mar. 1......	14	13	2	3	32	186	35
" 8......	5	11	4	5	25	146	49
" 15......	8	13	4	6	31	168	56
" 22......	10	7	..	4	21	147	31
" 29......	10	9	2	2	23	168	46
Totals.....	47	53	12	20	131	815	217
Apr. 5......	15	8	5	3	31	147	44
" 12......	8	11	1	6	26	134	50
" 19......	9	8	3	1	21	138	27
" 26......	9	8	4	8	29	138	46
Totals.....	41	35	13	18	107	557	167
May 3	4	10	3	5	22	138	42
" 10	6	9	6	4	25	172	36
" 17	14	5	3	3	25	160	39
" 24......	9	4	5	2	20	149	47
" 31	5	7	3	7	22	172	57
Totals.....	38	35	20	21	114	791	221
June 7......	6	7	1	4	18	226	68
" 14....	8	7	7	1	23	233	61
" 21......	7	3	2	6	18	195	59
" 28......	6	4	5	1	16	200	52
Totals.....	27	21	15	12	75	854	240

TABLE VII—CONTINUED.

1890. Week ending Saturday.	White Males.	White Females.	Colored Males.	Colored Females.	Weekly Mortality Consumption.	Mortality, all causes.	
						White.	Colored.
July 5......	9	9	3	2	23	193	49
" 12......	6	4	2	3	15	207	53
" 19......	7	12	2	2	23	194	54
" 26......	8	8	4	2	22	127	36
Totals.....	30	33	11	9	83	721	192
Aug. 2......	7	14	3	4	28	165	43
" 9......	4	8	3	6	21	158	50
" 16......	8	10	1	3	22	138	37
" 23......	8	5	1	3	17	105	36
" 30......	12	3	3	6	24	121	36
Totals.....	39	40	11	22	112	687	202
Sept. 6......	9	2	3	5	19	125	33
" 13......	7	6	2	3	18	127	37
" 20......	7	13	2	3	25	143	26
" 27......	10	6	4	1	21	128	34
Totals.....	33	27	11	12	83	523	130
Oct. 4......	8	6	2	5	21	134	33
" 11......	6	7	2	2	17	129	39
" 18......	10	7	3	1	21	131	35
" 25......	6	7	3	2	18	110	38
Totals.....	30	27	10	10	77	504	145
Nov. 1......	7	8	4	2	21	124	27
" 8......	7	8	2	3	20	114	28
" 15......	6	10	3	5	24	127	35
" 22......	9	6	2	5	22	129	39
" 29......	9	8	1	2	20	122	23
Totals.....	38	40	12	17	107	616	152
Dec. 6......	7	11	6	3	27	130	29
" 13......	12	7	2	2	23	136	33
" 20......	10	5	3	1	19	131	27
" 27......	9	6	3	1	19	108	33
4 days 31.....	6	10	4	2	22	90	30
Totals....	44	39	18	9	110	595	152

TABLE VII—CONTINUED

1890.

Total white mortality from all causes	8,026	From consumption	914	Ratio to total mortality	11.38
Total colored mortality from all causes	2,172	From consumption	335	Ratio to total mortality	15.42
Total combined mortality from all causes	10,198	From consumption	1,249	Ratio o total mortality	12.25

Total mortality for sixteen years, 1875–1890 *inclusive.*

Total white mortality from all causes	102,480	From consumption	13,267	Ratio to total mortality	13.04
Total colored mortality from all causes	30,453	From consumption	5,462	Ratio to total mortality	17.93
Total combined mortality from all causes	132,933	From consumption	18,729	Ratio to total mortality	14.08

Total mortality according to race and sex for sixteen years, 1875–1890 *inclusive.*

Total white males from all causes	52,129	From consumption	6,427	Ratio to total mortality	12.33
Total white females from all causes	50,351	From consumption	6,840	Ratio to total mortality	13.78
Total colored males from all causes	14,643	From consumption	2,441	Ratio to total mortality	16.67
Total colored females from all causes	15,810	From consumption	3,021	Ratio to total mortality	19.11
Total combined from all causes	132,933	From consumption	18,729	Ratio to total mortality	14.08

TABLE VIII.

Showing the Annual Mortality and Death Rate in the City of Baltimore, White and Colored, for ten years, 1880–1889, *inclusive: Births and Birth Rate, White and Colored, for six years,* 1884–1889 *inclusive (births not having been classified according to race prior to* 1884), *as compared with the year* 1890.

YEAR.	Annual Mortality.			Annual Death Rate per 1,000 of Population.			YEAR.	Births Reported.			Annual Birth Rate per 1,000 of Population.			Births, illegitimate.	
	White.	Colored.	Total.	White.	Colored.	Total.		White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.
1880	6,170	1,873	8,043	18.25	34.08	20.41	1880	......	......	......	......	......	......	...	......
1881	6,719	2,097	8,816	19.87	38,12	22.37	1881	......	......	......	......	......	......	...	......
1882	6,872	2,045	8,923	19.70	34.10	21.81	1882	......	......	......	......	......	......	...	......
1883	7,125	2,255	9,380	20.41	37.58	22.93	1883	......	......	......	......	......	......	...	......
1884	6,398	1,895	8,293	18.38	31.58	20.21	1884	6,899	1,136	8,035	19.76	18.93	19.64	124	173
1885	6,324	1,829	8,153	16.80	29.98	19.55	1885	6,632	1,108	7,740	18.63	18.16	18.56	112	171
1886	6,477	1,862	8,339	18.19	30.52	19.98	1886	6,481	1,213	7,694	18.20	19.88	18.46	103	155
1887	6,380	1,992	8,372	17.24	29.73	19.16	1887	7,565	1,262	9,027	17.74	18.83	20.65	146	224
1888	6,894	2,042	8,936	16.26	26.50	17.87	1888	7,500	1,225	8,725	17.70	15.92	17.45	134	220
1889	6,819	1,884	8,703	16.06	24.47	17.40	1889	8,102	1,263	9,365	19.25	16.40	18.73	156	205
Totals	66,184	19,774	85,958	......	.....	......	Totals	43,379	7,207	50,586	......	......	......	775	1,148
Average ..	6,618	1,977	8,596	18.12	31.66	20.17	Average ..	7,229	1,201	8,431	18.55	18.02	18.92	129	191
1890	8,057	2,141	10,198	20.98	30.15	22.41	1890	8,226	1,172	9,398	21.58	16.50	20.65	180	230

TABLE IX.

Showing the Mortality from Cancer in the City of Baltimore for Six Decades, 1830–1889 *inclusive; also the Population by United States Census at the Beginning of Each Decade, as Compared with the Year* 1890*:*

YEAR.	Population, U. S. Census.	DECADE.	Mortality from Cancer.
1830	80,990	1830–1839	81
1840	102,513	1840–1849	135
1850	169,054	1850–1859	193
1860	212,418	1860–1869	389
1870	267,354	1870–1879	1,059
1880	332,313	1880–1889	1,920
1890	434,439		
Taken by Police	455,427	Total mortality	3,777

Averaging 630 deaths per decade, or 63 per annum.

Total number of deaths from cancer for year 1890, 276.

TABLE X.

Baltimore's Longevity during Year 1890.

319 White Male	Decedents between	70 and 95 years.	Total years	24,466,	averaging	76 years	8 months.
442 White Female	" "	70 and 106 "	" "	34,645,	"	78 "	4 "
31 Colored Male	" "	70 and 108 "	" "	2,455,	"	79 "	2 "
67 Colored Female	" "	70 and 114 "	" "	5,567,	"	83 "	1 "
859 Decedents.			Total years,	67,133,	average,	78 years	2 months.

TABLE XI.

Showing the Progress of Typhoid Fever in the City of Baltimore, Covering a period of Sixteen Years, 1875–1890 *inclusive. Native and Foreign Whites, Males and Females; Colored Males and Females.*

YEAR.	Native Whites.		Foreign Whites.		Combined Whites.		Native Colored.		White & Col. Combined.		Grand Total.	Temperature.			Population.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Combined.	Mean.	Max.	Min.	White.	Colored.
1875	65	45	18	16	83	61	18	17	101	78	179	53.1°	97.0°	1.5°	*Estimated.* 257,000	42,834
1876	53	56	26	21	79	77	10	12	89	89	178	54.9°	99.0°	1.0°	262,583	43,747
1877	64	65	23	17	87	82	19	22	106	104	210	56.3°	95.0°	1.0°	268,137	44,689
1878	59	58	10	15	62	73	13	21	82	94	176	57.1°	98.0°	6.0°	273,704	45,618
1879	52	51	16	16	69	67	16	15	84	82	166	55.9°	99.0°	Zero.	279,273	46,545
															U. S. Cen	*sus*
1880	48	70	22	17	70	87	20	19	90	106	196	56.7°	99.0°	—3.6°	278,584	53,729
1881	58	54	23	16	81	70	17	29	98	99	197	57.1°	101.0°	—6.6°	*Estimated.* 337,540	56,256
1882	53	54	15	17	68	71	16	15	84	86	170	55.7°	97.0°	7.0°	348,900	59,620
1883	37	34	25	11	62	47	9	10	71	55	126	55.1°	96.0°	11.0°	351,190	60,230
1884	55	31	25	13	80	44	9	18	89	62	151	52.2°	94.8°	8.0°	353,480	60,840
1885	70	35	20	11	90	46	8	11	98	57	155	53.9°	98.7°	3.4°	355,770	61,450
1886	50	37	14	16	64	53	15	18	79	71	150	53.5°	92.2°	1.1°	355,770	61,450
1887	43	43	14	19	57	62	21	16	78	78	156	54.6°	101.8°	7.3°	379,385	66,770
1888	47	50	25	14	72	63	13	11	85	75	160	53.1°	95.8°	9.2°	423,782	76,561
1889	60	65	17	10	77	75	19	20	96	95	191	55.8°	93.0°	3.0°	423,782	76,561
															434,439 *U.*	*S. Cen*
1890	84	63	27	25	111	88	25	23	136	111	247	56.7°	98.0°	12.0°	384,394	71,033
Totals..........	898	811	310	254	1,218	965	248	277	1,466	1,342	2,808	......	......	......	....	......
Yearly average.	56	51	19	16	139	60	16	17	92	84	176	55.1°	...	...	....	......

TABLE XII.

Annual report of Deaths from all causes in the City of Baltimore for the year 1890.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Abscess	......	......	......	......	......	......	......	......	......	......	1	......	1
" of Breast	1	......	......	......	......	......	......	......	......	......	......	......	1
" " Pelvis	1	......	......	......	2	......	......	1	......	1	......	1	6
" " Liver	1	2	2	......	1	1	......	3	1	......	1	......	12
" " Head	......	1	......	......	......	......	......	......	......	......	......	......	1
" " Antrum	......	1	......	......	......	......	......	......	......	......	......	......	1
" " Kidney	......	1	......	......	1	......	......	......	......	......	......	......	2
" " Bladder	......	1	......	......	......	......	......	......	......	......	......	......	1
" " Brain	......	......	1	......	......	1	1	......	......	......	......	......	3
" " Groin	......	......	......	......	......	1	......	......	......	......	......	......	1
" " Bowels	......	......	......	......	......	......	......	1	......	......	......	......	1
" " Psoas	......	......	......	......	......	......	......	......	1	1	......	1	3
" " Side	......	......	......	......	......	......	......	......	......	1	......	......	1
" Thoracic	......	......	......	......	......	......	1	......	......	......	......	......	1
" Perinephritic	......	......	......	......	......	......	......	1	......	......	......	......	1
" Pulmonary	......	......	......	......	......	......	......	......	......	1	......	......	1
" Ovarian	......	......	......	......	......	......	......	......	......	1	......	......	1

Abscess, Peri Splenic											1		1
Albuminaria	1	3	4		1	1		1	1	1	1		14
Anæmia	1					1							2
" Pernicious	1			1							1	1	4
Aneurism of Aorta	2	1			1	1		1	2			3	11
" " Abdomen	1												1
Angina Pectoris		5	2	1	2	3	5	1	2	1	5	4	31
Apoplexy	12	10	20	13	15	15	20	15	25	21	25	13	204
Asphyxia	2				4			3	1		2	1	13
Asthma	9	4	11	8		4		3	3	3	6	4	55
Asthenia	10	6	11	4	6	5	8	5	6	3	5	5	74
Atelectasis Pulmonum	1	2	1	1			2	1	1	2	1		12
Acute Yellow Atrophy of Liver	1												1
Abortion		2					2				1		5
Arterial Sclerosis			2							1			3
Atheroma			1							1			2
Ascites			1		2	1	1	1		1	2		9
Anthrax					1								1
Amputation									2				2
Appendicitis										2	1		3
Atrophy										1	1		2
" of Liver											1		1
Adenitis											1		1
Adynamia											1		1
Bright's Disease	17	15	18	15	28	19	6	12	12	19	10	16	187
Burns	2	2	3				1			3	3	8	22
Biliary Obstruction										1			1

TABLE XII—Continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Cancer	......	......	......	......	1	......	......	......	......	......	......	......	1
" of Brain	1	......	......	......	......	......	......	......	......	......	......	......	1
" of Neck	1	......	1	......	......	......	......	1	......	1	......	2	6
" of Jaw	1	......	......	2	......	......	......	......	......	......	......	......	3
" of Tongue	2	......	......	1	1	......	......	......	......	......	......	1	5
" of Breast	4	4	3	1	1	2	4	5	2	1	......	3	30
" of Œsophagus	1	......	1	......	1	......	......	1	......	......	......	......	4
" of Duodenum	1	......	......	......	......	......	......	......	......	......	......	......	1
" of Liver	1	2	1	2	3	2	......	5	1	1	6	1	25
" of Stomach	6	4	6	5	8	7	5	10	3	4	3	3	64
" of Ovaries	1	......	......	......	......	......	......	......	......	1	......	......	2
" of Rectum	1	2	......	......	2	......	1	......	......	......	......	1	7
" of Bladder	1	......	......	......	......	......	......	1	......	1	......	......	3
" of Uterus	8	7	8	8	8	5	5	5	8	7	8	9	86
" Diffused	......	1	......	......	......	......	......	......	......	......	......	1	2
" of Abdomen	......	......	3	2	1	1	......	......	1	3	......	1	12
" of Omentum	......	......	1	......	......	......	1	......	......	......	......	......	2
" of Pylorus	......	......	......	1	......	......	......	......	......	......	......	......	1
" of Larynx	......	......	......	1	1	......	......	......	......	......	......	1	3

Cancer of Pelvis					1			1					2
" of Vulva					1								1
" Ventricular					1								1
" of Mesenteric Glands					1								1
" of Palate					1								1
" of Pharynx						1							1
" of Parotid Gland						1							1
" of Face							1	1					2
" of Gall Bladder							1						1
" of Penis								1					1
" of Lip									1			1	2
" of Kidney									1			1	2
" of Colon										1			1
" of Eye											1		1
Cæsarean Section											1		1
Consumption of Lungs	135	114	132	107	114	75	83	112	83	77	107	110	1,249
Convulsions	31	33	34	28	35	30	15	27	23	18	17	20	311
" Puerperal	1	3		2	2		1	1	1	2	4	2	19
Capillary Bronchitis	16	10	12	15	13	4	1	8	3	7	5	8	102
Catarrh		3	3		1								7
" Bronchial	3	2	2	1				2		1	3	1	15
" Intestinal										1			1
" Nasal										2			2
Calculus		1				1							2
" Biliary	2				1			1		1			5
Child Birth	1		3		1			3		2	3	2	15
Cholera Infantum					46	235	124	77	20	3	1	1	507

TABLE XII—Continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Cholera Morbus	......	......	......	......	......	8	10	2	2	1	......	......	23
Cirrhosis of Liver	3	2	3	1	4	2	5	1	1	4	......	4	30
Concussion of Brain	......	1	......	......	......	1	......	......	......	......	1	......	3
Congestion of Brain	10	3	11	11	6	4	4	3	6	1	2	3	64
" of Lungs	13	14	7	4	7	......	3	4	4	5	6	5	72
" of Liver	......	......	1	......	1	......	......	......	......	......	......	......	2
Croup	9	2	10	3	1	......	1	1	3	......	6	9	45
Cyanosis	3	......	4	3	3	2	4	2	4	......	3	6	34
Colic	......	1	1	......	......	......	1	2	......	......	......	......	5
Congestive Chill	......	......	1	1	1	......	......	......	......	......	1	......	4
Cellulitis	......	......	......	3	2	......	......	......	......	......	......	......	5
Coxalgia	......	......	......	......	......	1	......	......	......	......	......	......	1
Chorea	......	......	......	......	......	......	......	......	1	......	......	......	1
Cramps	......	......	......	......	......	......	......	......	......	1	......	......	1
Disease of Heart	34	27	37	31	45	31	32	36	22	37	47	51	430
" of Spine	......	1	......	......	2	......	1	......	......	......	......	......	4
" of Hip	......	......	1	......	1	......	......	......	......	......	......	......	2
" of Liver	......	......	1	......	......	......	......	......	1	......	......	......	2
" of Brain	......	......	......	......	......	......	......	......	......	......	......	1	1

Dyspepsia	......	......	......	......	......	......	......	1	......	1	1	1	4
Dropsy, General	6	3	......	2	5	3	......	......	3	3	2	1	28
" Cardiac	......	1	......	......	......	1	......	2	......	......	......	......	4
Debility	2	1	3	3	......	......	1	......	2	2	......	......	14
Drowned	8	8	2	5	7	9	11	11	4	6	2	......	73
Dysentery	3	3	8	6	28	56	56	19	14	10	7	2	212
Dentition	12	6	10	8	21	19	6	19	13	4	7	3	128
Delirium Tremens	3	1	1	......	......	1	......	......	......	......	1	1	8
Diabetes	3	2	3	1	2	2	......	3	1	1	......	1	19
Diarrhœa	5	2	4	2	18	35	31	23	16	6	4	3	149
Diphtheria	26	18	24	16	21	7	13	24	15	27	43	40	274
Dystocia	......	1	......	......	......	......	......	......	......	......	......	......	1
Entero Colitis	1	......	3	1	20	29	20	26	10	6	3	......	119
Endocarditis	4	1	......	1	1	2	1	......	1	1	1	4	17
Epilepsy	1	3	2	......	2	......	1	1	.....	3	1	......	14
Erysipelas	5	2	4	4	1	2	......	2	......	......	3	2	25
Effusion of Brain	1	......	......	......	......	......	......	......	......	1	......	......	2
Extra Uterine Pregnancy	......	2	......	......	......	......	......	......	1	......	......	......	3
Exposure	......	3	5	1	1	......	......	......	......	......	1	......	11
Embolism	......	......	1	......	1	......	......	......	1	1	......	......	4
Eczema	......	......	......	......	1	......	1	......	......	......	......	......	2
Empyema	......	......	......	......	......	......	1	......	......	......	......	2	2
Enlarged Prostate	......	.....	......	......	......	......	......	......	......	......	1	......	1
Epistaxis	......	......	......	......	......	......	......	......	......	......	......	1	1
Fever, Malarial	2	3	3	2	5	6	3	6	7	7	3	......	47
" Typho-Malarial	......	3	5	3	1	3	6	7	6	5	12	3	54
" Cerebro Spinal	2	7	......	2	3	2	4	3	3	2	......	3	31

TABLE XII—Continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Fever, Intermittent	......	......	......	......	1	......	2	......	......	......	1	......	4
" Puerperal	1	......	......	......	......	......	2	1	1	......	......	2	7
" Remittent	1	2	2	2	3	1	......	......	4	......	......	......	15
" Scarlet	2	2	5	5	5	4	7	......	......	3	5	4	42
" Typhoid	10	12	15	19	13	13	29	36	30	34	25	11	247
Fracture of Spine	1	1	......	......	......	......	1	......	......	......	......	......	3
" of Femur	1	......	......	......	......	1	1	......	1	1	......	2	7
" of Skull	2	1	2	......	1	......	......	1	1	1	1	1	11
" of Ribs	......	......	1	......	......	......	......	......	......	1	......	......	2
" of Humerus	......	......	......	......	......	......	1	......	......	......	......	......	1
" of Pelvis	......	......	......	......	......	......	......	2	......	......	......	......	2
Gastro-Enteritis	4	4	6	5	31	32	23	11	15	8	8	3	150
Gastro-Duodenitis	......	1	......	......	......	......	......	......	......	......	......	......	1
Gangrene, Senile	......	......	1	......	......	......	......	1	1	2	1	1	7
" Pernicious	......	......	......	......	......	......	......	......	1	......	......	......	1
" of Foot	......	......	......	1	......	......	......	......	......	......	......	......	1
Gout	......	......	......	......	1	......	......	......	1	......	......	......	2
Gall Stones	......	......	......	......	......	1	......	......	......	......	......	......	1
Glioma of Brain	......	......	......	......	......	1	......	......	......	......	......	......	1

Hemorrhage of Stomach	1	......	1	......	......	......	......	......	1	......	1	......	4
" of Uterus	1	1	......	1	1	......	......	......	3	......	......	1	8
" of Lungs	2	1	4	2	1	......	1	......	1	1	1	1	15
" of Brain	3	1	5	2	2	2	6	7	2	3	1	6	40
" of Navel	3	......	2	......	......	......	2	1	3	......	......	1	12
" of Bowels	......	......	1	......	1	......	1	......	......	......	......	......	3
" Post Partum	......	......	......	......	1	......	......	2	......	......	......	......	3
" of Bladder	......	......	......	......	......	......	......	......	1	......	......	......	1
Hernia	......	1	1	2	......	1	......	1	......	......	......	......	6
" Strangulated	......	1	4	3	......	2	1	......	1	......	......	2	14
Hydrothorax	1	......	......	......	1	1	......	......	......	......	......	......	3
Hæmoptysis	2	......	......	......	......	......	1	1	......	......	......	1	5
Hydrocephalus	......	2	2	1	2	1	2	3	3	......	2	......	18
Hysterectomy	......	......	1	......	......	......	......	......	......	......	......	......	1
Hernia, Congenital Cerebral	......	......	1	......	......	......	......	......	......	......	......	......	1
Hæmatemesis	......	......	1	......	......	1	......	......	1	1	1	......	5
Hyperæmia	......	......	......	......	......	1	......	......	......	......	......	......	1
Indigestion	3	......	......	......	......	4	......	......	2	1	......	1	11
Inanition	4	15	16	8	24	24	24	16	9	9	10	13	172
Insanity	3	......	1	......	2	1	3	1	1	......	1	......	13
Intemperance	3	......	2	1	2	1	1	1	1	......	......	4	16
Influenza	......	10	5	......	2	......	......	......	......	......	......	......	17
Intussusception	......	1	1	2	1	4	3	......	4	1	3	......	20
Ischuria	......	......	2	......	......	......	......	......	......	......	......	......	2
Infanticide	......	......	......	1	......	......	......	2	......	......	......	2	5
Insolation	......	......	......	......	......	1	......	......	......	......	......	......	1
Inflammation of Pleura	3	2	1	1	......	3	1	......	......	......	3	4	18

TABLE XII—Continued.

Causes of Death.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Inflammation of Brain	3	3	......	2	4	5	3	2	4	3	7	4	40
" of Bladder	2	6	1	2	4	3	1	1	......	3	4	3	31
" of Bowels	4	5	12	3	9	24	11	17	6	5	4	5	105
" of Stomach	11	5	5	3	7	9	3	7	7	12	10	8	87
" of Bronchi	22	22	23	20	18	11	15	20	14	15	25	25	230
" of Kidneys	5	11	13	5	7	9	6	7	5	7	16	11	102
" of Larynx	......	1	4	......	2	1	1	1	......	6	2	1	19
" of Liver	1	......	1	2	3	1	2	2	1	1	3	1	18
" of Pericardium	......	3	......	......	1	1	3	2	......	......	......	1	11
" of Peritoneum	7	2	13	7	11	5	5	13	2	4	7	2	78
" of Tonsils	1	......	......	......	......	......	3	......	1	1	1	1	8
Jaundice	......	......	1	2	1	3	2	3	2	......	1	3	18
Laparotomy	......	......	1	......	1	......	......	......	1	......	......	2	5
Leucocythæmia	......	......	......	......	......	......	1	......	......	......	......	1	2
Malformation	3	3	......	......	2	......	1	......	......	......	......	1	10
Mal-nutrition	1	......	2	1	1	7	10	1	3	3	1	1	31
Marasmus	16	18	16	17	32	51	37	42	26	21	20	13	309
Measles	31	37	83	39	31	19	6	9	1	......	......	......	248
Meningitis	13	8	14	14	16	19	15	15	12	8	17	9	160

Meningitis, Tubercular	6	7	16	4	14	8	12	7	4	5	3	8	94
Murder	1	1	1	1	2	......	......	2	1	1	......	1	11
Morphiomania	1	......	......	......	......	......	......	......	......	......	......	......	1
Metritis	......	1	......	......	......	......	......	......	......	......	......	......	1
Malignant Pustule	......	1	......	......	......	......	......	......	......	......	......	......	1
Myelitis	......	......	1	1	......	1	1	......	......	......	......	......	4
Multiple Neuritis	......	......	1	1	......	......	......	......	1	......	......	......	3
" Sclerosis	......	......	......	......	......	......	......	......	......	1	......	......	1
Mumps	......	......	......	......	......	......	1	......	1	......	......	1	3
Menopause	......	......	......	......	......	......	......	......	......	......	1	......	1
Necrosis	1	2	1	......	......	1	1	......	......	......	1	......	7
Neurasthenia	......	1	1	1	......	1	2	......	1	1	......	......	8
Non Viable	......	......	1	......	......	......	......	......	......	......	......	......	1
Noma	......	......	......	......	......	......	......	1	......	......	......	......	1
Old Age	38	26	40	32	34	24	31	24	22	20	28	31	370
Oedema of Lungs	3	2	......	......	1	......	2	1	1	......	......	......	10
Otorrhagia	1	......	......	......	......	......	......	......	......	......	......	......	1
Ovariotomy	1	......	......	1	......	......	1	......	......	......	......	......	3
Otitis	......	......	1	......	......	1	1	......	......	......	......	......	3
Obstruction of the descending Vena Cava	......	......	1	......	......	......	......	......	......	......	......	......	1
Ovaritis	......	......	......	......	1	......	......	......	......	......	......	......	1
Otorrhœa	......	......	......	......	......	......	......	......	......	1	......	......	1
Puerperal Peritonitis	2	......	......	2	1	1	1	1	1	1	1	1	12
" Septicæmia	......	6	2	1	1	3	2	2	3	2	2	......	24
" Metritis	......	......	1	......	......	......	......	......	......	......	......	......	1
Paralysis	20	24	24	12	12	19	19	14	8	14	21	18	205

TABLE XII—Continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Pneumonia	185	98	127	100	103	44	15	26	18	38	60	106	920
" Typhoid	3	2	1	1	1	......	......	2	1	1	1	......	13
" Pleuro	2	1	5	1	1	3	1	1	1	1	.....	1	18
" Broncho	4	4	7	......	2	5	......	......	1	2	3	2	30
Premature Birth	9	15	23	20	22	17	18	20	12	20	22	11	209
Prolonged Labor	1	1	......	1	......	2	2	1	1	1	......	......	10
Progressive Locomotor Ataxia	1	......	......	......	......	1	1	1	......	......	1	1	6
Pemphigus	......	1	1	......	......	......	......	......	......	......	......	......	2
Pyæmia	......	1	1	......	......	2	1	......	......	2	......	......	7
Poison	......	......	2	......	2	2	2	......	3	......	1	......	12
Pregnancy	......	......	1	......	......	......	......	......	......	......	......	......	1
Persistent Vomiting	......	......	1	......	......	......	......	......	......	......	......	......	1
Purpura	......	......	......	......	1	......	......	......	1	1	......	......	3
Proctitis	......	......	......	......	1	......	......	......	......	......	......	......	1
Pharyngitis	......	......	......	......	1	......	......	......	......	......	......	......	1
Potts' Disease	......	......	......	......	......	......	1	......	1	......		......	3
Periostitis	......	.....	......	......	......	......	1	1	......	......	......	......	2
Prostatitis	......	......	......	......	......	......	1	......	......	......	......	......	1
Pyopneumothorax	......	......	......	......	......	......	1	......	......	......	......	......	1

Placenta Prævia								1	1	2	1		5
Perityphlitis										1			1
Rheumatism	3	2	7	3	4	1	1	2	1	4		2	30
" Inflammatory	3	3	6		4	2		2	2		1	1	24
Rhachitis		1											1
Rupture of Varicose Vein									1				1
Suffocation by Illuminating Gas	2		2								1		5
Scrofula	2		2	2	2	1			1	2	3	4	19
Softening of Brain	5	2	2	1	4	5	3	3	7	3	6	2	43
Stricture of Bowels	1	1	1	2	3	3	2	1	3		1		18
" of Pylorus					1								1
" of Oesophagus								1					1
Suicide	2	1	2	2	1	1	3	1	3	1	5	3	25
Syphilis	4	3	2	2		3	2	2		1	1		20
Scalds		1	1		1	4							7
Septicæmia		2	4	1	2		3	1	1		1		15
Spina Bifida		1			1								2
Stomatitis			3			2					2		7
Spinal Sclerosis					1		1					1	3
Sciatica							1						1
Sun Stroke							7	2					9
Sclerosis, Arterial												1	1
" Cerebral												1	1
Tetanus	1	1	1	1	1		2	1		1	1	2	12
Trismus Nascentium	2	2	2	3	4	2	4	2	7	2	3	2	35
Tumor, Ovarian	1	1	1	1	2	1			1	3	3	2	16
" Abdominal	1												1

TABLE XII—Continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Tumor, Gastric	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
" Cerebral	.....	2	1	.....	.....	1	1	1	.....	.....	1	.....	7
" Uterine	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Tabes Mesenterica	.....	.....	.....	1	.....	.....	3	1	.....	1	.....	.....	6
Typhlitis	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2
Tubercular Peritonitis	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Tuberculosis of Knee Joint	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Ulcer of Stomach	1	1	.....	1	.....	1	1	.....	1	1	1	1	9
" of Rectum	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
" of Leg	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	1	3
" of Bowels	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....	2
" of Bladder	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	2
Uræmia	1	4	3	1	3	1	.....	1	1	.....	1	3	19
Unknown, Infants	.....	4	.....	.....	3	2	.....	.....	1	1	1	2	14
" Adults	.....	.....	.....	1	.....	2	.....	.....	.....	.....	1	1	5
Whooping Cough	4	6	10	6	1	6	12	17	17	11	4	6	100
Wounds by Fall	3	4	3	3	.....	3	2	5	5	7	5	5	45
" by Pistol Shot	1	1	.....	1	.....	.....	.....	.....	.....	.....	2	.....	5
" by Cars	4	2	5	4	6	2	2	6	1	2	.....	2	36

Wounds, Crushed	......	1	......	1	1	......	......	1	......	3	3	1	11
" by Gun Shot	......	1	......	1	......	......	......	1	......	......	1	1	5
" by Kick of Horse	......	......	......	......	1	......	......	......	......	......	......	......	1
" by Injury to Scalp	......	......	......	......	......	1	......	......	......	......	......	......	1
" by Explosion of Mineral Water Font	......	......	......	......	......	1	......	......	......	......	......	......	1
" by Electric Light Wire	......	......	......	......	......	1	......	......	......	......	......	......	1
" by Pitchfork	......	......	......	......	......	1	......	......	......	......	......	......	1
" by Stab	......	......	......	......	......	......	......	......	1	......	......	......	1
" by Spinal Injury	......	......	......	......	......	......	......	......	......	1	......	......	1
Grand Total	930	787	1032	724	1012	1094	913	889	653	649	768	747	10,198

TABLE XII—Continued.

AGES—1890.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	GRAND TOTALS.
Under 1 year	169	167	219	166	311	482	321	273	177	152	148	155	2,740
Between 1 and 2 years	80	84	106	69	95	115	71	75	65	32	54	48	894
" 2 " 5 "	46	38	71	40	60	36	33	36	32	24	32	35	483
Total under 5 years	295	289	396	275	466	633	425	384	274	208	234	238	4,117
Between 5 and 10 years	36	25	58	33	51	41	32	37	21	40	34	33	441
" 10 " 15 "	10	11	14	13	15	16	22	18	10	13	18	12	172
" 15 " 20 "	29	28	27	13	26	22	22	38	22	33	25	22	307
" 20 " 30 "	85	71	83	64	84	53	73	58	60	63	80	69	843
" 30 " 40 "	82	65	93	74	61	64	69	64	51	55	85	71	834
" 40 " 50 "	108	69	90	54	62	48	45	83	46	50	54	75	784
" 50 " 60 "	97	72	77	61	75	63	53	59	52	56	70	69	804
" 60 " 70 "	107	87	111	80	105	88	85	84	64	79	96	99	1,085
" 70 " 80 "	44	38	51	38	48	44	58	37	34	34	42	30	498
" 80 " 90 "	32	27	27	16	19	17	22	23	15	15	26	25	264
" 90 " 100 "	5	5	5	3	0	4	6	1	2	3	3	4	41
" 100 " 110 "	......	......	......	......	......	......	1	2	2	0	1	0	6
Above 110 years	......	......	......	......	......	1	......	1	......	......	......	......	2
Totals	930	787	1032	724	1012	1094	913	889	653	649	768	747	10,198

NATIVITY.													
U. S.—White Males	307	226	343	226	321	369	292	287	201	211	226	240	3,249
" " Females	242	240	323	212	329	367	275	276	196	173	235	237	3,105
Foreign—White Males	106	74	75	63	79	71	76	66	59	66	78	50	863
" " Females	97	71	74	56	62	47	78	58	67	54	77	68	809
Colored—Males	97	84	101	75	115	120	100	81	59	65	70	80	1,047
" Females	81	92	116	92	106	120	92	121	71	80	82	72	1,125
Totals	930	787	1032	724	1012	1094	913	889	653	649	768	747	10,198
Still-births	66	52	57	78	84	69	44	73	64	61	78	74	800
Marriages	343	331	279	428	301	380	313	281	423	438	457	392	4,366
Births (Reported)	826	795	829	507	796	619	775	868	723	655	827	1078	9,398

Population November 29, 1890, by Police Census, 455,427; White, 384,394; Colored, 71,033; Total, 455,427. Total mortality during the year, United States, White, 6,354; Foreign, 1,672: Colored, 2,172; Total, 10,198. Annual Death Rate per 1,000, whole population, 22.41; White, 20.98; Colored, 30.15; Total Births (reported), 9,398; Birth Rate per 1,000 population, Whites, 21.58; Colored, 16.50; Whole population, 20.65. Total Marriages, 4,366; Marriage Rate per 1000 population, 9.60. Total Still-births; 800.

TABLE XII—Continued.

Total number of Deaths Monthly in each Ward.

WARDS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
First	74	52	62	39	67	61	59	77	38	32	34	52	647
Second	44	38	48	34	44	50	57	39	32	22	30	26	464
Third	38	32	33	22	30	49	27	35	29	19	30	28	372
Fourth	40	32	49	27	27	26	25	28	22	38	33	30	377
Fifth	26	24	39	31	35	29	31	34	22	26	28	24	349
Sixth	62	51	73	55	67	62	72	79	61	34	49	43	708
Seventh	50	49	54	33	71	62	65	49	34	34	31	38	570
Eighth	44	32	58	38	49	64	38	39	41	41	41	40	525
Ninth	45	35	54	47	41	46	35	36	38	29	39	41	486
Tenth	36	26	26	18	36	30	27	29	19	23	27	23	320
Eleventh	40	32	33	17	32	64	20	38	14	26	37	32	385
Twelfth	52	42	72	48	72	50	54	57	33	47	47	51	625
Thirteenth	39	26	37	34	40	37	21	24	24	21	29	22	354
Fourteenth	31	26	42	26	39	49	35	32	15	27	35	23	380
Fifteenth	26	24	43	29	25	35	29	25	23	24	28	28	339
Sixteenth	28	36	30	22	30	41	20	34	13	24	21	21	320
Seventeenth	45	49	69	41	57	62	43	59	46	27	34	48	580

Eighteenth	55	41	62	45	79	65	67	45	53	42	43	56	653
Nineteenth	47	40	40	36	53	81	56	31	29	35	39	36	523
Twentieth	58	39	43	34	43	44	52	28	34	33	50	30	488
Twenty-first	18	21	25	20	34	35	31	28	13	12	24	22	283
Twenty-second	32	40	40	28	41	52	49	43	20	33	39	33	450
Totals	930	787	1032	724	1012	1094	913	889	653	649	768	747	10,198

TABLE XII—Concluded.

The Number of Deaths Monthly.

BIRTHS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
White Males	352	361	356	262	354	297	345	363	335	312	365	496	4198
" Females	364	292	374	257	342	251	337	406	309	268	359	469	4028
Total	716	653	730	519	696	548	682	769	644	580	724	965	8226
Colored Males	54	75	50	42	49	26	43	43	41	30	54	64	571
" Females	56	67	49	46	51	45	50	56	38	45	49	49	601
Total	110	142	99	88	100	71	93	99	79	75	103	113	1172
Illegitimate White	6	18	10	19	15	18	15	16	10	17	14	22	180
" Colored	24	32	16	19	30	13	18	24	12	9	18	16	229
Total Illegitimate	30	50	26	36	45	31	33	40	22	26	32	38	409

METEOROLOGICAL SUMMARY FOR THE YEAR 1890.

FROM SIGNAL SERVICE RECORDS.

PRESSURE.

Mean Barometer...... ...29.98 inches, .08 below normal.
Highest “ ....30.62 “ on January 22.
Lowest “ ... .29.35 “ on October 29.
Range of “ .... 1.27 “

TEMPERATURE.

Mean Temperature........56.7 degrees, 1.2 above normal.
Highest “ ....98 “ on July 8.
Lowest “ ....12 “ on March 7.
Mean Winter (1889 and 1890) Temperature, 44.5 degrees, 12.3 degrees above that of 1888 and 1889, and 9.0 degrees above normal.
Mean Spring Temp.........53.2 degrees, .1 below normal.
“ Summer “ ....73.8 “ 2.0 “ “
“ Autumn “ ....57.8 “ .8 above “
Mean Temperature of December, 35.0 degrees, 11.0 degrees below the Mean Temperature of December, 1889, and 2.0 degrees below normal.

PRECIPITATION.

Total Precipitation during the year, 46.96 inches, 3.89 inches above normal. Number of days on which rain or snow fell, 154. Greatest Monthly Precipitation, 5.98 inches in May. Least Monthly Precipitation, 74 inches in November.

WINDS.

Prevailing direction northwest.

Highest velocity, thirty-nine miles per hour, from northeast, on December 17.

Mean velocity, 5.3 miles per hour.

Total movement, 46,344 miles.
Mean relative humidity, 68 per cent,
First heavy frost in Autumn, October 31.
Last snow of season, 1889 and 1890, April 1.
First snow of season, 1890 and 1891, November 20.

METEOROLOGICAL SUMMARY FOR THE YEAR, 1891.

The records since January 1, 1891, of the local signal service station show the daily variations in temperature, precipitation, wind and weather. The following figures are given for the first eleven months of the year 1891.

MONTHS.	Days in Month.				Precipitation in in.	Mean temperature.	Mean humidity.
	Cloudless.	Partly Cloudy.	Cloudy.	Rainy.			
January	15	8	8	13	4.89	37.6°	70.4°
February	8	10	10	16	5.52	41.4°	71.8°
March	11	5	15	18	4.94	38.6°	72.4°
April	15	9	6	10	2.48	56.0°	56.8°
May	13	5	13	14	3.11	62.2°	60.5°
June	16	6	8	11	5.45	71.5°	71.4°
July	7	14	10	14	7.79	71.6°	72 4°
August	4	16	11	13	4 24	74 3°	80.4°
September	17	11	2	5	5.46	70 6°	81.0°
October	14	8	9	9	2.76	54.8°	75.1°
November	12	12	6	11	1.33	44.3°	74.6°
Total	132	104	98	134	50 97		

The rainy days include those on which snow, hail or sleet fell. The total rainfall for the eleven months has not been equaled in any year since 1887, excepting 1889, when it was 61.74 inches.

The two heaviest rains were on July 7 and 8, when the depth of rain in 24 hours was 2.59 inches, and on September 5 and 6, when 4 inches of rain fell in 9 hours and 10 minutes. The greatest rains in 24 hours for the other months were: January 11, 1.44 inches;

February 21 and 22, 1.50 inches; March 27 and 28, 1,54 inches; April 11, 1.08 inches; May 28 and 29, only .90 inches; June 17 and 18, 2.05 inches: August 24 and 25, 1.43 inches; October 22, 1.06 inches, November 10 and 11, only .51 inches.

Only 1.3 inches of snow fell in January and 3.5 inches in February. The March record is 20.5 inches, but no snows have been recorded in any other month.

A curious weather freak was a thunderstorm on January 11, during which .98 inches of rain fell. The humidity—86°—and maximum temperature—52°—are among the highest recorded during the month. A dense fog prevailed before the storm.

A thunder-storm occurred April 11, and others on May 11, 22 and 31, June 3, 4, 15, 17, 21 and 22, July 3, 15, 24 and 28, August 12, 21 and 24, September 5 and 6. October 26 and November 23, making 22 times since January 1.

The prevailing winds were from the northwest in every month excepting May, when they blew from the northeast, and in July, when they came from the southwest. The day on which it blew greatest was November 23. It was a southern breeze and traveled at the rate of 48 miles per hour. November also shares second place in wind velocity with June, the rate being 40 miles per hour on June 4 and November 17, blowing, respectively, from the northeast and northwest. The dates of the wind velocities over 25 miles per hour in each month and the directions from which the wind came are: January 12—28 miles, N. W.; 22—27 miles, S. W.; 25—28 miles, S. W. February 28—26 miles, S. March 27—26 miles. N. E.; 28—25 miles, N. E. May 22—25 miles, N. June 4—40 miles, N. E.; 22—30 miles, N.; 26—36 miles, N. E. July 4—28 miles, N. W.; 15—36 miles, N. W. August 12—36 miles, N. W.; 21—26 miles, N. W. (See October below.) November 17—40 miles, N. W.: 18—28 miles, N. W., 23—48 miles, S.; 28—26 miles, N.

The highest temperature registered since January 1, 1891, was 94°, which occurred June 16, August 10 and 11. The lowest temperature was 16°, which is 16° below the freezing point. This occurred on February 5 and March 2. On the 18th instant the thermometer went down to 17°, and on November 30 to 18°. It will be seen by the table that the mean monthly temperature from June to September remained almost constant, being 71.5° in June, 71.6° in July, 74.3° in August and 70.6° in September. The mean temperature for January, 37.6°, is the lowest of any month. The greatest daily range of the thermometer was on April 30, when the maximum temperature of the month was reached at 86°, the thermometer having run up from 52° during the day. The least daily range was 2°, which occurred on January 31 and May 23. On the former day the range was from 38° to 40°, and on the latter from 56° to 58. The greatest daily ranges of the thermometer for each month are: January 27, 23°; February 16, 27°; March 16, 26°; April 30, 34°; May 11, 30°; June 8, 26°; July 7, 25°; August 12, 24°; September 21, 26°; October 26, 32°; November 17, 31°. The least daily range for each month was; January 31, 2°; February 19, 5°; March 31, 3°; April 10, 4°; May 23, 2°: June 7, 6°; July 8, 3°; August 25, 5°; September 8, 7°; October 12, 3°, and November 29, 4°. The following tables give the maximum and minimum temperatures for each day since January 1:

Date.	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept		Oct.		Nov.		Dec.	
	Max.	Min.	Max.	Min.	Max.	Min	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1.	42	34	63	37	28	20	44	38	80	64	81	60	78	65	77	59	77	64	69	51	57	47	48	27
2.	54	40	55	42	27	16	45	39	70	56	88	67	67	59	82	65	79	60	76	60	48	40	51	30
3.	34	30	54	40	34	24	52	40	70	54	90	70	77	61	75	64	80	67	85	59	46	34	52	33
4.	30	21	26	20	42	20	43	38	70	46	80	66	79	59	78	66	80	68	85	66	44	32	62	40
5	32	22	34	16	36	24	44	30	54	44	60	54	76	61	75	68	75	67	80	64	42	36	58	38
6.	37	24	50	32	33	22	46	32	54	40	66	54	81	58	79	68	80	62	56	49	50	36	53	38
7.	36	22	46	38	40	27	50	33	62	45	56	50	85	60	86	66	76	65	60	50	57	35	55	40
8.	40	25	49	37	39	34	55	34	77	48	73	47	61	55	89	71	66	59	63	52	57	36	43	32
9.	35	27	42	33	47	37	55	36	86	57	76	50	76	56	92	74	70	51	62	48	58	36	51	32
10.	44	30	46	35	47	34	48	44	85	60	79	62	79	60	94	74	74	52	59	48	64	48	59	33
11.	52	33	42	29	52	32	61	45	88	58	83	60	76	61	94	74	73	53	67	52	62	55	56	48
12.	45	37	40	31	49	40	59	48	69	54	84	67	84	62	91	67	76	60	44	41	64	42	51	37
13.	38	32	46	37	54	40	68	41	67	53	83	62	82	62	82	68	78	59	51	43	54	39	57	39
14.	47	31	44	31	37	27	79	47	68	56	87	61	89	72	84	64	75	63	65	48	55	35	64	39
15.	39	30	47	27	36	21	82	56	57	51	93	68	88	68	83	65	78	56	67	47	48	38	54	46
16.	42	31	67	40	57	31	73	57	70	50	94	71	82	70	83	64	80	62	61	45	56	42	56	43
17.	36	32	73	58	36	24	70	54	64	44	90	70	82	64	82	64	84	58	59	41	64	33	33	28
18.	37	32	71	50	50	29	80	55	77	48	71	61	77	69	83	69	90	64	61	40	35	22	33	17
19.	41	26	38	33	52	38	84	64	78	53	66	58	85	66	82	66	86	73	60	53	41	21	49	24
20.	45	31	40	31	42	37	71	57	77	59	74	61	81	67	82	69	77	64	56	43	48	32	43	30
21.	46	33	55	39	42	36	70	54	76	62	78	68	84	68	83	68	85	59	62	45	54	36	..	..
22.	54	41	47	38	52	37	81	55	88	65	88	69	80	68	85	68	86	66	49	40	61	49	..	..
23.	50	35	45	32	60	49	76	63	58	56	88	70	82	71	90	75	86	70	54	40	62	48	..	..
24.	45	33	53	34	55	48	67	57	62	49	85	65	84	66	83	72	81	66	62	43	54	38	..	..
25.	41	32	62	51	55	41	65	45	67	57	89	65	84	67	72	67	83	64	57	38	52	36	..	..
26.	48	28	42	33	45	31	69	42	71	62	91	68	76	61	78	66	86	66	77	45	44	38	..	..
27.	60	37	31	24	37	32	82	51	62	51	77	63	77	61	86	72	84	65	51	41	57	36	..	..
28.	50	38	44	22	41	32	75	61	69	54	82	58	82	64	81	68	81	66	49	36	57	42	..	..
29·	46	41	..	..	50	38	70	44	65	52	83	60	77	66	65	57	73	65	59	33	28	24	..	..
30.	55	44	..	..	58	39	86	52	72	58	85	64	80	68	67	54	70	56	65	44	34	18	..	..
31.	40	38	..	..	45	42	..	..	77	62	..	..	75	61	72	58	..	..	74	45	..	..	..	..

The table shows that the thermometer has registered above 90° on five days in June, five days in August and one day in September, and that it has registered below the freezing point, or 32°, on sixteen days in January, eleven days in February, fifteen days in March, one day in April, five days in November and six days in December, or a total of eleven days above 90° and fifty-four days below the freezing point.

To those who love the old-time winters of snow-drifts, coasting, and sleighing, March was the only ideal winter month, for the recorded snow-fall was

20.5 inches. This in a large measure accounts for the great precipitation (7.94 inches) in March.

July, owing to its heavy rainfall of 2.59 inches on the 7th and 8th, fell but little below March in the amount of precipitation. The total for July was 7.79 inches, which is .15 below the total for March.

August was the hottest month. The mean temperature for the month was 74.3°, which was 2.7° higher than the mean temperature for July. On five days the thermometer registered over 80°, and it did not fall below 54° during the month. On 16 days it registered between 80° and 90°. The rainfall, 4.24 inches distributed over thirteen days in the month, was above the average, and furnished some relief from the high temperature.

September was the month of sunny skies, with more cloudless and less rainy days than any other month credited to it. September's rainfall, outside of the mighty downpour of 4 inches of water on the 5th and 6th of the month, was only 1.46 inches.

Six times during October the wind sped along at a rate exceeding 25 miles per hour; from the northeast at 28 miles per hour on the 12th; from the northwest at 30 miles on the 21st; from the north at 26 miles on the 22d; from the northwest at 32 miles on the 23d; from the same direction at 36 miles on the 26th, and at 28 miles on the 27th of the month.

November goes on record as the dry month not only in Baltimore, but along the Atlantic seaboard, and the period in which the water supply of New York city was nearly exhausted. The total precipitation for the month in Baltimore was 1.33 inches, less than half the precipitation of any other month except April, which was 2.48 inches. The greatest rain in any 24 hours was scarcely half an inch. It is a curious fact that November was the dry month of last year, only .74 inch of rain falling in the month.

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